

**SOUTH M & M TIMBER HARVEST, ROAD MANAGEMENT AND  
RIPARIAN RESTORATION PLAN**

**FISCAL YEAR 2004  
ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT  
IMPACT**

**CASCADES RESOURCE AREA  
SALEM DISTRICT OF BUREAU OF LAND MANAGEMENT**

EA NUMBER: OR080-2003-20

PREPARED BY: Randall L. Herrin & James S. England

DATE: October 20, 2003

SUMMARY: This environmental assessment (EA) discloses the predicted environmental effects of two action alternatives and the no action alternative for federal land located in Township 12 South, Range 3 East, Sections 19 and 30, Willamette Meridian; in Linn County within the Quartzville Creek Watershed. Two projects will be analyzed in this EA. Project 1 is the South M&M proposal to commercially thin approximately 243 acres in the Matrix land use allocation, and 29 acres of density management in the Riparian Reserve in accordance with the Salem District Resource Management Plan and the Northwest Forest Plan. Project 2 is the decommissioning of 1,200 feet of existing road

Responsible Agency: USDI - Bureau of Land Management

Responsible Official: William B. Keller, Acting Field Manager  
Cascades Resource Area  
1717 Fabry Road SE  
Salem, OR 97306  
(503) 375-5968

For further information, contact: Randall L. Herrin or James S. England,  
Project Leaders  
Cascades Resource Area  
1717 Fabry Road SE  
Salem, OR 97306  
(503) 375-5646

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# **FINDING OF NO SIGNIFICANT IMPACT**

## **Introduction**

The Bureau of Land Management has analyzed the potential effects of timber harvest in the Cascades Resource Area, Quartzville Creek watershed. The actions described in the Environmental Assessment (EA) for the South M & M Timber Sale and related actions are proposed for the intent of meeting the need for forest products and forest habitat as described in the *Salem District Resource Management Plan* (RMP, 1995, pp. 1 and 2). The EA is attached to this Finding of No Significant Impact (FONSI) determination and is incorporated by reference.

The Finding of No Significant Impact, the proposal and associated design features described in the EA will be made available for public review prior to making a decision on the action. The public notice of availability for review will be published in a legal notice by local newspapers of general circulation and through notification of individuals, organizations, and state and federal agencies with affected interests.

Comments regarding this Environmental Assessment should be received by the Salem District Office by **November 19, 2003**.

Implementation of the proposed action would conform to management actions and direction contained in the ROD/RMP (*Salem District Record of Decision and Resource Management Plan*), dated May 1995, which is tiered to and incorporates the analysis contained in the RMP/FEIS (*Salem District Proposed Resource Management Plan /Final Environmental Impact Statement*), dated September 1994. The ROD/RMP provides a comprehensive ecosystem management strategy in conformance with the *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-successional and Old-growth Related Species Within the Range of the Northern Spotted Owl* (February 1994), the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl and Standards and Guidelines For Management of Habitat for Late-successional and Old-growth Related Species Within the Range of the Northern Spotted Owl* (April 1994).

Implementation of the Proposed Action would also conform with the *Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines* (ROD, January, 2001) and the *Final Supplemental Environmental Impact Statement for Survey and Manage, Protection Buffers, and Other Mitigation Measures in the Northwest Forest Plan* (FSEIS, November, 2000).

Other documentation guiding this action includes the *Quartzville Creek Watershed Analysis* (September, 2002).

The following shows how this action relates to required components of the Aquatic Conservation Strategy (RMP, p. 5 - 7):

Component	Component Relationship of This Action
Riparian Reserves	Strict adherence to Riparian Reserve guidelines as established on page 10 of the RMP, and on page F-2 of the Quartzville Creek Watershed Analysis.
Key Watersheds	The Quartzville Creek watershed is not a Key Watershed (RMP p. 6).
Watershed Analysis	Watershed Analysis for the Quartzville Creek watershed has been completed.
Watershed Restoration	Portions of the Riparian Reserves in the Quartzville Creek watershed may receive treatments in order develop snags and large down woody debris, habitat features which are lacking in the area. Treatments would occur in several locations throughout the Riparian Reserves over the next several years.

## Finding of No Significant Impact Determination

Based upon review of the EA and supporting documents, I have determined that the Proposed Action (Alternative B) is not a major federal action and would not significantly affect the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects meet the definition of significance in context or intensity as defined in 40 CFR 1508.27. Therefore, an environmental impact statement is not needed. This finding is based on the following discussion:

**Context:** Under this proposal the BLM would commercially thin approximately 243 acres of Matrix and 29 acres of Riparian Reserve lands. It is expected that this will yield 3,900 MBF. The timber harvest and related treatments would be located in Sections 19 and 30, T. 12 S., R. 3 E., W.M. in the Quartzville Creek Watershed (Chapter 6: Maps). There would be approximately 3.3 miles of new road constructed, then blocked after use to prevent vehicular access. Approximately 1,200 feet of existing rocked road would be decommissioned in the project area. All ground disturbing equipment would be cleaned prior to entry and prior to leaving to prevent the spread of noxious weeds.

The purpose for the proposed actions described and analyzed in this Environmental Assessment (EA) is to contribute to fulfilling the legal mandates to manage BLM lands as described in the *Salem District Resource Management Plan* (RMP, 1995, p. 1, and 2):

- To contribute to meeting the need for a healthy forest ecosystem.
- To manage BLM land in a way that meets the need to protect watersheds.
- To manage habitat for plant and animal species so that management activities do not preclude the recovery of a listed species nor contribute to the need to list a species under the Endangered Species Act (ESA).
- To contribute to meeting the need for a sustainable supply of timber and other forest products that would help maintain the stability of local and regional economies and contribute valuable resources to the national economy, on a predictable and long-term basis.

The EA details the effects of the proposed action. None of the effects identified, including direct, indirect and cumulative effects, are considered to be significant and do not exceed those effects described in the RMP/FEIS.

**Intensity.** The following discussion is organized around the Ten Significance Criteria described in 40 CFR 1508.27.

1. **Impacts may be both beneficial and adverse.** The beneficial and adverse effects of the proposed action are described in Chapter 3 of the EA, Affected Environment and Environmental Effects.
2. **The degree to which the selected alternative will affect public health or safety.** Public health and safety was not identified as an issue.
3. **Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farm lands, wetlands, wild and scenic rivers, or ecologically critical areas.** There are no known historic or cultural resources. There are no park lands, prime farm lands, or wildernesses that would be affected by the proposed action. The sale area does not qualify for potential wilderness nor has it been nominated for an Area of Critical Environmental Concern.
4. **The degree to which the effects on the quality of the human environment are likely to be highly controversial.** The predicted effects are not highly controversial. A complete disclosure of the predicted effects of the proposed action is contained in the EA.
5. **The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.** The actions are local in nature; potential adverse impacts would be short-term. Impacts were determined based on research, observation, professional training, and experiences by an interdisciplinary team of natural resource specialists. Determining such environmental effects reduces the uncertainties to a level, which does not involve highly unknown or unique risks.
6. **The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.** Portions of the proposed action would be located within the Riparian Reserve land use allocation, and management of that area would not retard or prevent the attainment of the ACS objectives (Appendix B). No hazardous materials or solid waste would be created in the sale area. No harvest of late-successional forest habitat would occur. There would be no reduction in the total amount of late-successional forest habitat on federal forestlands (RMP pg. 22) (EA Section 3.7).
7. **Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.** The interdisciplinary team conducted a cumulative effects analysis and no significant cumulative effects were predicted (EA Chapter 3, Sections 3.2, 3.7 & 3.10). The design features identified in the EA would assure that no significant site specific nor cumulative impacts would occur to the human environment other than those already addressed in the FEIS, SEIS, and FSEIS.

8. **The degree to which the action may adversely affect districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.** The proposed action would not adversely affect districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places, nor would the proposed action cause loss or destruction of significant scientific, cultural, or historical resources (EA).

9. **The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.** This project “may affect, and is likely to adversely affect” the spotted owl due to the modification of dispersal and marginal suitable habitat. The South M&M proposal was submitted on September 3, 2002 as part of the Biological Assessment (BA) addressing the effects of fiscal year 2003-2004 routine habitat modification projects on threatened and endangered species within the Willamette Province. Section 7 Consultation with the United States Fish and Wildlife Service (USFWS) has been completed (Biological Opinion {BO} reference #1-7-00-F-0008, dated February 27, 2003). As a result of consultation, the USFWS found that the proposal would not likely jeopardize the continued existence of the spotted owl (BO pp. 1, 45-46), and anticipates incidental take (BO pp. 1, 46-47). The proposed timber sale area is located in Critical Habitat for the spotted owl in the Matrix. The BA concluded that the South M&M proposal would result in modification of Critical Habitat (CHU OR-14). As a result of consultation, the USFWS concluded that the proposal is not likely to destroy or adversely modify Critical Habitat for the spotted owl (BO pp. 1, 46).

No federally listed fish species are found in the Quartzville Creek Watershed. The upstream boundary of the Upper Willamette River Evolutionarily Significant Unit for Chinook salmon and steelhead trout is located at Foster Dam, downstream of Quartzville Creek and Green Peter Reservoir. Therefore, a determination has been made that this project would have no effect on Upper Willamette River Chinook salmon or steelhead trout. Consequently, no consultation with NOAA-Fisheries is required.

10. **Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.** The proposed action does not violate any known Federal, State, or local law or requirement imposed for the protection of the environment. The alternatives are consistent with other Federal agency and State of Oregon land use plans and with the Linn County land use plan and zoning ordinances. Any permit requirements associated with the implementation of this project would be obtained and complied with. Project design features would assure that potential impacts to water quality would be in compliance with the State of Oregon In-stream Water Quality Standards and thus the Clean Water Act. Additionally, the proposed action is consistent with applicable land management plans, policies, and programs.

Prepared By:

Randall L. Herrin October 16, 2003  
Randall L., Herrin, IDT Co-Leader Date

James S. England 10/16/03  
James S. England, IDT Co-Leader Date

Reviewed By:

Carolyn D. Sands Oct 20, 2003  
Carolyn Sands, NEPA Coordinator Date

Approved By:

William B. Keller Oct 20, 03  
William B. Keller Date  
Cascades Resource Field Manager, Acting



# **ENVIRONMENTAL ASSESSMENT**

## **1.0 Chapter 1 - Project Scope**

### **1.1 Project Location**

The project is located approximately twelve miles northeast of Sweet Home, Oregon, in Linn County, Sections 19 and 30, Township 12 South, Range 3 East, Willamette Meridian (WM) within the Quartzville Creek fifth field watershed (EA section 6.1: Vicinity Map). The proposal is on forested land managed by the Cascades Resource Area, Salem District, Bureau of Land Management (BLM).

The proposed project is located within both the General Forest Management Area (GFMA) and Connectivity portions of the Matrix and Riparian Reserve land use allocations (LUA), as identified within the Salem District Record of Decision and Resource Management Plan (RMP) dated May 1995. In addition, BLM lands in Township 12 South, Range 3 East, Sections 19 and 30 are in Critical Habitat designated for the northern spotted owl, as described in the Federal Register, January 15, 1992, Part II, Department of the Interior, Fish and Wildlife Service, 50 CFR Part 17, Final Rule, Critical Habitat Unit OR-14. Areas under consideration for this project are neither in nor are they tributary to designated Key Watersheds (RMP p. 6). The Quartzville Watershed is above Green Peter Dam, and is not a part of a municipal watershed.

### **1.2 Purpose and Need**

This project would involve habitat restoration and harvesting trees by thinning prescriptions on 243 acres in the Matrix and 29 acres in Riparian Reserve.<sup>1</sup> The forest stands in the proposal range from 50 to 130 years of age. Species diversity and stand structure are limited, especially in stands 50 to 70 years of age, which were previously either clearcut with tractor logging or commercially thinned, which simplified their developing structure and associated diversity.

#### ***Forest Management:***

The purpose of this project would be to contribute to both the immediate and long-term sustainable supply of timber and other forest products, which would contribute to local and State economic diversity, as described in the RMP (pp. 20, 46-48). Thinning and density management activities are proposed to achieve these goals and maintain future forest management options and protect other resource values.

Stands in GFMA which have reached Culmination of Mean Annual Increment (CMAI) (between approximately 70 and 110 years of age) are typically scheduled for regeneration harvest to produce maximum average annual growth over the lifetime of the timber stand (RMP p. 48).

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<sup>1</sup> All numbers (e.g., acres, road lengths and volumes) are estimates based on GIS mapping and office analysis. Final numbers, determined during field work, will vary from these estimates. This variance is not expected to result in a change in effects analyzed in this document.

However, these stands could also be partial cut to provide some level of immediate timber harvest, retain options for future stand management, and maintain canopy cover to provide for other resource values. Stands which have not yet reached CMAI, may be thinned to increase timber production or to achieve other management objectives in suitable stands where topography and road access are favorable, or aerial yarding methods are used (RMP p. 48).

### ***Development of Stand Diversity and Structure:***

The emphasis of this proposal would be thinning and density management to improve stand diversity and structure, maintain canopy closure, and provide for other resource values (Interdisciplinary Team [IDT] field review and office meeting, May 20 & 28, 2003). In order to retain future management options on a landscape level, timber harvest and related management practices would be designed to maintain a variety of stand age and size classes in the vicinity, provide for windfirm forest stands at densities that allow timber stand growth at or near what the site is capable of supporting, be resistant to insects, diseases and wildfires, protect water quality, and provide elements of complex stand structure such as snags, down logs, and more rapid development of larger diameter trees.

In the Connectivity land use allocation, forest management practices would be designed to encourage the development of older forest conditions at stand ages of approximately 100 to 120 years, to provide for connectivity habitat between Late-Successional Reserves and to maintain ecologically valuable structural components such as down logs, snags, broken top trees, large trees, diverse tree and understory species, and variable stand densities (RMP pp. 21, 48).

### ***Roads:***

Decommissioning sections of unmaintained roads within Riparian Reserves is needed to restore elements of a properly functioning riparian ecosystem and reduce sediment production. New roads may be constructed to facilitate yarding and hauling activities, provided that they meet ACS objectives (RMP, pp.11-12).

### ***Riparian Reserves:***

The purpose of Riparian Reserve treatments are to move towards attainment of ACS Objectives and contribute to the restoration of properly functioning ecosystems by enhancing the development of certain attributes of stand diversity and structure (RMP, pp.5-7). These include down logs, standing dead/cull material, variable stand densities, species diversity, canopy layering, and more rapid development of larger diameter trees and live crowns. Approximately 29 acres of the proposed project is classified as Riparian Reserve. Twenty one acres are a uniform 50 year old Douglas-fir dominated stand that is the result of clearcut logging. Eight acres are a uniform 70 to 80 year old stand that was commercially thinned for timber production goals in the early 1970s. Both of these stands lack structural diversity due to past management practices. The RMP and the Quartzville Watershed Analysis (QWA) support thinning young to mid-age Riparian Reserves stands to increase stand diversity and structure (RMP p. 11, QWA chp7, p.6).

## **Conclusion:**

In summary, the purpose and need for this project is to:

- Improve stand diversity and structure, maintain canopy closure, and provide for other resource values through thinning and density management.
- Increase stand diversity and structure of forest stands in portions of the Riparian Reserve to meet ACS habitat objectives.
- Manage stands in Connectivity to contribute to the goal of developing older forest conditions.
- Contribute toward District timber management goals and local economic diversity.
- Manage these timber stands on Matrix lands for a sustainable supply of timber and other forest commodities for future harvest and other management options.
- Manage the roads in the area to meet transportation needs and ACS objectives.

### **1.3 Plan Conformance and Tiering**

Implementation of the proposed action would conform to management actions and direction contained in the *Salem District Record of Decision and Resource Management Plan* (ROD/RMP), dated May 1995, which is tiered to and incorporates the analysis contained in the *Salem District Proposed Resource Management Plan /Final Environmental Impact Statement* (RMP/FEIS), dated September 1994.

The ROD/RMP provides a comprehensive ecosystem management strategy in conformance with the *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-successional and Old-growth Related Species Within the Range of the Northern Spotted Owl* (February 1994), the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl and Standards and Guidelines For Management of Habitat for Late-successional and Old-growth Related Species Within the Range of the Northern Spotted Owl* (April 1994).

Implementation of the Proposed Action would also conform with the *Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines* (ROD, January, 2001) and the *Final Supplemental Environmental Impact Statement for Survey and Manage, Protection Buffers, and Other Mitigation Measures in the Northwest Forest Plan* (FSEIS, November, 2000). Other documentation guiding this action includes the *Quartzville Watershed Analysis* (September 2002).

### **1.4 Decision to be Made**

The Cascades Field Manager will decide whether or not to prepare an environmental impact statement, and which, if any, of the projects and alternatives described in this environmental assessment to implement.

## **1.5 Issues**

An issue is a major point of discussion about environmental effects of the proposed action.

Resource effects can be issues when the effects of the project:

- Lead to the development of action alternatives, and/or are likely to adversely affect a T/E species (May affect, likely to adversely affect), and/or
- Result in adjusting the proposed action, or is a major point of discussion in the IDT meetings, and/or
- Could have a major beneficial effect on the resource. There is a major adverse effect of the no action alternative.

Concerns expressed during Public Scoping and IDT Review were evaluated and analyzed to determine whether they were issues as defined above (Appendix A). Issues identified were addressed in detail in Chapter 3, Section 3.3. Other resource effects are described in Section 3.2, and Tables 3-1 and 3-2.

### **1.5.1 Issues to be addressed in Detail:**

The Scoping and Issue Identification Summary (Appendix A) identified five issues, all associated with Project 1, Forest Management:

- The effects of the proposal on spotted owls and Critical Habitat.
- The effects of new road construction.
- The effects of the proposal on red tree voles.
- The effects of the proposal on recreational use.
- The effects of laminated root rot in the project area.

### **1.5.2 Affected Resources that were not determined to be Issues:**

The following affected resources were not determined to be issues (Appendix A), all associated with Project 1, Forest Management: Air Quality, Cultural Resources, Threatened, Hazardous or Solid Wastes, Water Quality, Wetlands/Riparian Zones, Invasive Nonnative Species, Fire Hazard/Risk, Soils and Site Productivity, Special Areas outside ACECs, Special Status and SEIS Special Attention Species/Habitat (Plants and Wildlife), Visual Resources, and Water Resources.

No issues or affected resources associated with Project 2, road decommissioning approximately 1,200 feet of existing road, were identified.

## **2.0 Chapter 2 - Alternatives, Including the Proposed Actions**

The Forest Management/Restoration Project Alternative, a Limited Road Construction Alternative and the required No Action Alternative, presented in this section are analyzed in Chapters 3 of this EA.

### **2.1 No Action Alternative, Alternative A**

The BLM would not implement any of the South M & M projects at this time. The local plant and animal communities would be dependent on and respond to ecological processes that would continue to occur based on the existing condition as modified by time, the elements and forces unforeseen here. This alternative serves to set the environmental baseline for comparing effects to the proposed action.

### **2.2 The Proposed Action, Alternative B**

#### **2.2.1 Project 1 – Forest Management & Stand Development**

##### ***Within the Matrix LUA:***

Commercially thin 243 acres in four units (EA section 6.3: Alternative B Map). Table 2-1 shows acres, and silvicultural treatment by unit. For other unit information (e.g. logging systems), see Table 6-1 in EA section 6.3. Species diversity and stand structure are limited in these stands, which were previously either clearcut with tractor logging or commercially thinned, simplifying their structure and associated diversity. Tree canopy closure after treatment will be at least 40%.

##### ***Within the Riparian Reserve LUA:***

This action would commercially thin approximately 29 acres of mid-seral Riparian Reserve conifer dominated stands to a variable residual tree density. The treatment would be applied with the goal of initiating and accelerating the development of a more diverse stand. The treatment areas would contain some areas of light intensity thinning, some areas of moderate intensity thinning, and some areas of a heavier intensity thinning. The heaviest thinned acres would make up approximately 15% of the treated Riparian Reserves. Tree canopy closure after treatment will range between 50% and 80%. In addition, some areas would be left unthinned. There would be a varying width buffer of fifty feet or to a logical ecological break on all streams. No treatments would occur within the buffer.

Western red cedar, hardwoods, and most cull and deformed trees would be retained on the site. Open grown “wolf trees” would be reserved and maintained in an open grown condition. Snags over 12” DBH, and all coarse woody debris, would be reserved from cutting unless safety is compromised. If needed to be cut, they would not be removed from the site. In the Riparian Reserve commercial thinning areas, any trees cut for yarding corridors would be left on site for CWD (up to 480 lineal feet per acre).

Habitat restoration treatments without wood removal would also be done within Riparian Reserve treatment areas. Up to 4 trees per acre (generally conifer trees > 20” DBH) may be base or top girdled to create snags or spike topped trees.

**Table 2-1: Summary Table for Alternative B**

Unit Number	Acres	Land Use Allocation	Road Const.	Prescription
A	5	GFMA	0	Commercial Thinning
	20	Connectivity		
	1	Riparian		Riparian Thinning
B	91	GFMA	4,900	Commercial Thinning
	40	Connectivity		
	8	Riparian		Riparian Thinning
C	78	GFMA	12,600	Commercial Thinning
	18	Riparian		Riparian Thinning
E	9	GFMA	0	Commercial Thinning
	2	Riparian		Riparian Thinning
Total Matrix	243	Matrix		
Total Riparian	29	Riparian Reserve		
Grand Total	272		17,500	

***Connected Actions:***

- Construct and block after treatment, 17,500 feet of new road construction in units B and C to facilitate log truck access and yarder locations capable of allowing one end suspension uphill skyline yarding of commercial thinnings (Table 6-2 in EA section 6.3). There would be several helicopter landings constructed and additional trees cut to provide unobstructed flight paths for drop zones and service landings. New roads would be constructed according to the best management practices as outlined in Appendix C of the RMP.
- Maintenance and renovation of BLM roads used, consisting of roadside brushing, blading the road surface, spot rocking and ditch and culvert maintenance to maintain roads to the standards described in the transportation management objectives and Best Management Practices in the RMP. These standards are designed to provide for safety, reduce the potential for sediment entering streams from the roads, and facilitate timber harvest.
- Update drainage systems maintenance (culverts, ditches, water bars, etc.) to current 100-year storm event standards.

**2.2.2 Project 2 – Road Management**

All work described in this project is separate and independent from any road work described under *Project 1*. Management of existing and future roads in the project area needs to be addressed because of the current road densities.

Approximately 1200 feet of existing road would be decommissioned. Roads 12-3E-19.1B, 19.05, and 19.09 have been identified as being suitable for decommissioning. Roads to be closed would be storm proofed prior to closure. This may include improving drainage and removing stream culverts.

## 2.3 Limited Road Construction, Alternative C

### 2.3.1 Project 1 - Forest Management

Under this Alternative, new road construction would be limited (EA section 6.4: Alternative C Map, Tables 6-3 and 6-4). There would be two more helicopter landings constructed and additional trees cut to provide unobstructed flight paths for drop zones and service landings. There would be some construction of short spur roads, each generally 200 feet in length or less. Up to 1000 feet of road construction is planned. Areas accessed by new road construction under Alternative B would be logged using an aerial logging system (Table 2-2). All other components of Alternative B would remain the same under this Alternative.

## 2.4 Comparison of Alternatives for Selected Parameters

**Table 2-2: Comparison of Alternatives for Selected Parameters**

Comparison of Selected Parameters		Alternatives				
		A	B		C	
			Units	Acres	Units	Acres
Cutting Type	Regeneration Harvest	0	None	0	None	0
	Commercial Thin	0	A, B, C, E	243	A, B, C, E	243
	Riparian Thin	0	A, B, C, E	29	A, B, C, E	29
Logging System	Tractor	0		117		99
	Skyline	0		95		29
	Cable	0		8		17
	Helicopter	0		52		127
Landings & Road Construction		0	17,500 Ft	10.0	1,000 Ft	5
Land Use Allocation	GFMA	0	A, B, C, E	183	A, B, C, E	183
	Connectivity	0	A, B	60	A, B	60
	Riparian Reserve	0	A, B, C, E	29	A, B, C, E	29

## 2.5 Design Features and Mitigation Measures – Both Action Alternatives

### 2.5.1 Project 1 –Forest Management

#### General

- Place seasonal restrictions on all felling, yarding, and road construction operations from March 1 – July 15 to minimize the risk of disturbance to nesting spotted owls. This seasonal restriction could be waived early if ongoing surveys indicate no presence of nesting spotted owls within disturbance range of the harvest units.
- Place a seasonal restriction from January 1 through August 31 on helicopter operations over the southern portion of unit B to minimize the risk of disturbance to nesting bald eagles. This seasonal restriction could be waived if surveys indicate the bald eagles are not nesting.
- Log hauling would not be allowed on any Saturday, any Sunday, or weekdays which are part of the Memorial Day, July 4th and Labor Day holidays.

- If any cultural and/or archeological sites are identified during timber harvesting, the operations would be immediately halted and the Field Manager would be notified. Operations would be resumed only with the Field Manager's approval, and only after appropriate mitigation measures were designed and implemented to provide any needed protection of those resources.
- Known locations of red tree voles would be protected according to Management Recommendations for the Oregon Red Tree Vole dated September 27, 2000.
- Known locations of Survey and Manage fungi and mollusks would be protected with no entry buffers as necessary to maintain microhabitat.

### **Roads**

All road work would utilize the Best Management Practices (BMPs) required by the Federal Clean Water Act (as amended by the Water Quality Act of 1987) to reduce non-point source pollution to the maximum extent practicable.

- Road and landing construction, maintenance and use requirements would be designed to keep soil compaction and disturbance within the minimum surface area needed for safe operations.
- New roads would be constructed according to the best management practices as outlined in Appendix 3 of the RMP. All new roads would be decommissioned and/or blocked upon project completion. Blocking would include water barring so that water drains quickly to stable slopes, seeding and fertilizing and blocking access.
- New roads may be pit run rock surface with drainage designed to minimize erosion and prevent sediment from entering streams. Roads would be of minimum width, typically 12-foot average running surface with 55-foot minimum curve radius with curve widening. Alignment would retain all old growth remnant trees and minimize damage to leave trees.
- Roads would include inside ditches or cross drains, or outsloped or insloped depending on design criteria to provide for continuous self draining of the right-of-way.
- A series of gates would be installed on roads 12-3E-19.0, -19.1, -19.2, -19.4, -19.7, -19.8 and -30.2 which pass through the treatment area. These gates would be closed during the time that the Oregon State Department of Forestry has declared Regulated Use to be in effect. The gates would be open during the remainder of the year. It is anticipated that the gates would remain open year round once the woody debris causing an increased fire hazard created by operations has decomposed. This is expected to occur within five years of operations. See EA section 6.5: Fire/Fuels Road Plan Map for specific locations of gates and pull back area.
- Road construction and stabilization operations would be limited to dry soil conditions.
- Newly disturbed soil associated with road and landing construction would be seeded (with a locally adapted mix of native species seed).
- Waterbars would be constructed as necessary to minimize erosion and prevent sediment from entering streams.
- Helicopter landings would be decompacted and seeded following operations.
- Damaged, deteriorated and under-sized culverts on existing roads would be replaced, and new culverts installed, as needed to meet current 100 year storm event standards.
- Hauling would be restricted to conditions that would not contribute to erosion or sedimentation of streams. During wet weather, hauling would be limited to surfaced roads with well maintained crowned running surfaces and drainage features. Hauling would be suspended if erosion or subgrade damage occurs and would not resume until appropriate conditions or measures are in place to minimize erosion or subgrade damage.



- No new road construction would occur within riparian reserves.
- Fill slopes would be seeded with native vegetation after road construction prior to the winter wet season.
- Maintain vegetation in ditches within 200 feet of all stream crossings. When ditches have been newly constructed or cleaned, place sediment trapping/filtering materials in the ditch above all stream crossings.
- Natural surface roads left over the winter would require erosion control measures to prevent erosion prior to winter and may include; erosion matting, drainage modification, seeding or other appropriate techniques to prevent soil loss.
- All road decommissioning should be accomplished as soon as feasible after timber harvest.
- Road decommissioning would include: removal of culverts, decompaction of the road surface, establishing native vegetation to stabilize soil, and drainage modification. Drainage modification may include out-sloping and water bars.
- Replacement of live stream culverts would be conducted during the in-water work period of June 1 to September 30, and may include installation of erosion matting, shaping the streambed and banks, seeding, and other erosion control measures to prevent sediment additions to streams.
- Road 12-3E-29 crosses perennial streams at two locations in the project area. The road drainage at both locations would be improved prior to project activities. In addition, both sites would be monitored regularly during haul by the authorized contract officer. If the road surface deteriorates and drainage is resulting in water pollution, hauling would be halted until mitigation measures have been taken and sediment is no longer entering streams.
- Trap or filter sediment from water flowing in ditches before it enters streams.
- Spur roads in the vicinity of the proposed timber harvest units would be cleaned up and stabilized, if needed, to maintain drainage and runoff patterns. These roads may be blocked and/or waterbarred to prevent vehicles from disturbing the road surface and creating mud, and to minimize the likelihood of dumping.

#### **Tractor Skidding/Ground Based Logging Equipment**

- Tractor skidding trails and other ground based logging equipment use would be designed to confine soil compaction and disturbance to less than 10 percent of the area.
- Skid trails used in previous entries would be re-used wherever feasible to concentrate potential impacts on areas already impacted.
- Ground based logging equipment would be allowed to skid logs with one end suspension on slopes generally less than 35 percent. Exceptions may be granted for very short pitches of steeper slopes where avoiding the slope would cause greater impacts than operating on the slope, or for ground based logging equipment which provides for full suspension and mechanized falling equipment within the Matrix on approved trails, on appropriate soil types for slopes up to 45 percent. Harvest layout and road construction alignments are designed to avoid adverse skidding on slopes generally greater than 20 percent.
- Tractor/ground based equipment operations would be limited to dry soil conditions (generally July 1 through October 31). Erosion control structures such as waterbars should be current and must be completed prior to October 31 annually.
- Slash and organic debris may be left on tractor trails to the extent which is feasible in order to minimize damage to soils.
- Waterbars would be constructed on tractor trails as necessary to minimize erosion and prevent sediment from entering streams.

- Access to skid trails would be blocked to prevent off road vehicles (ORVs) from driving on them. Blockades would be constructed using a ditch and berm, by piling slash and woody debris at the front of the trail or both.
- All roads and landings that have exposed soil following use and stabilization would be seeded with a locally adapted mix of native species seed.
- Skid trail patterns would be designed to avoid concentrating runoff water flows or directing them into streams.

### **Cable Winching**

Areas designated for cable winching are for small areas where tractors are prohibited. The minimum requirements for cable winching generally include directional falling individual trees to the lead, pulling winch line by hand to the log for choking, and inhaul spooling mechanically to the winch drum prior to skidding or decking.

### **Skyline Yarding**

- Skyline yarding would be designed to confine soil compaction and disturbance to less than 10 percent of the area.
- Yarding with one end suspension of logs would be required to prevent gouging and accelerated erosion.
- Limiting the number and spacing of Skyline corridors by requiring lateral yarding.
- Construct roads and landings to position the yarder up the fall line from each lift tree to minimize skyline corridor width and sidehill yarding.
- Utilize lift trees and multi-span skyline systems to achieve one end suspension.
- Downhill skyline yarding without full suspension would be seasonally restricted to dry soil conditions to minimize compaction and gouging. Downhill yarding is not expected.
- Yarding corridors would be restricted to the minimum number feasible.
- Waterbars would be installed on yarding corridors as needed.
- If lift or tail trees are required in Riparian Reserves, they would be felled or topped as necessary for safety but would not be removed.

### **Logging in Riparian Reserves**

Logging systems to accomplish Density Management in Riparian Reserves would be designed to meet the following criteria:

- Compacted and disturbed soil from logging operations would be confined to less than five percent of the area.
- No new multi-pass skid trails would be created. Existing skid trails may be used.
- Single passes with low ground pressure undercarriage equipment operating on top of a slash and brush mat has been demonstrated to result in extremely low compaction and disturbed soil, and would be allowed. Other systems meeting the criteria may also be used.
- Ground based harvesting in riparian reserve areas would be limited to slopes under 30%. Exceptions may be granted by the authorized officer for very short pitches where avoidance of the slope would cause greater impact.
- Yarding would not be allowed through riparian reserves except areas designated for riparian density management in this proposal.
- Some tailholds and guylines in riparian reserves could be necessary to yard the units. These trees could be felled if necessary for safety reasons but would not be removed.

### **Fuel Treatment**

- After harvest operations are completed landing debris would be piled, covered and burned.
- Slash and brush may be piled for burning to reduce potential fire hazard. If piled with an excavator, work would be limited to dry soil conditions.
- Slash piles would be covered with plastic sheeting when piled, then burned after the fall rains begin.
- In order to reduce the amount of slash adjacent to roads 12-3E-29, 12-3E-30.0 and 12-3E-30.1, all activity fuels within 125 feet of these roads would be piled and burned. One method commonly used to reduce the amount of slash adjacent to roads may be to directionally fell designated timber away from these roads.

### **Vegetation:**

- No falling, skidding or yarding would be allowed during the spring growing season (typically April 01 to July 01) when bark and cambium are easily damaged by those operations.
- Skidding and yarding techniques designed to minimize damage to residual trees would be required. Examples of potential techniques include: pre-planned skid/yarding trails, falling to lead, rub trees, etc.
- Most cull and deformed trees would be retained for structural diversity and potential wildlife habitat.
- Old growth trees and many of the largest second growth would be reserved from harvest in all units. They would not be felled unless essential to provide for human safety. If felled, they would be reserved as CWD.
- Prior to entering BLM lands, ground disturbing and off-road machinery would be washed so that it is free of noxious weed/invasive plants seed and plant parts.
- Retain existing large snags and down logs where feasible.
- Top up to two green trees per acre to create cull trees with deformed crowns that are expected to develop desirable habitat characteristics.
- Favor minor conifer species (such as western red cedar), and hardwoods for retention. In all units, maintain an average minimum of 40 percent canopy closure immediately after harvest to maintain spotted owl dispersal habitat.

### **Special Forest Products (SFP)**

- Following harvest of commercial timber, firewood cutters would be allowed to cut and remove firewood from landing piles. Logs contributing to the 240 lineal feet of CWD per acre would be excluded from firewood cutting.
- SFP permits for entire plants would be issued for areas designated for road construction prior to the start of construction activities.

## **2.6 Alternatives Dropped from Detailed Analysis**

In addition to the No Action Alternative and the proposed action described above, the IDT considered additional areas for potential harvest and discussed a variety of additional options during the course of the analysis. The IDT considered the following alternatives that were dropped from detailed analysis.

- Regeneration harvest of approximately 32 acres in Section 18 (Unit F) was dropped for a variety of reasons. This area has no existing road access. The area has numerous larger old trees and active Red Tree Vole nests [EA section 6.2: Contour Map (including units dropped)]
- Regeneration harvest of 5 acres in Section 19 (Unit D) was dropped due to steep slopes and numerous larger old trees present in the stand.
- Developing road access into Unit A was considered but dropped due to the steep side slopes that would have required full bench road construction. Such road construction would have been more impacting to the soil, hydrology and visual resources than the proposed action.
- Uneven age management of 7 acres in Section 20 (Unit G) was dropped. Construction of 1,425 feet of new road would have required. The unit was dropped due to the presence of a number of large trees and remnant old growth.
- Approximately 8,600 feet of road construction (over and above what is identified in Alternative B) was considered but was dropped to reduce the amount of road construction required. As a result of dropping this construction, 26 additional acres were identified for helicopter logging.
- *Phellinus* *verrii* Management - *Phellinus* *verrii* (laminated root rot) has been found within the proposed thinning units. It was proposed to patch cut the larger laminated root rot areas removing, cutting, or killing all sound susceptible tree species (Douglas-fir) in the infection area plus a one chain buffer surrounding the infection. Site preparation (handpiling) would be done and the treated areas planted with disease resistant species such as sugar pine. Another alternative considered was to thin through the laminated root rot areas. The consensus of the IDT was to defer treatment of infected areas plus a 1 chain buffer surrounding them, due to their location in visually sensitive areas in Critical Habitat.

### **3.0 Chapter 3 – Affected Environment and Environmental Effects**

#### **3.1 Introduction**

The first part of the chapter is the Environmental Elements Review Summary which describes the affected elements of the human environment required by law, regulation, Executive Order and policy (See BLM Manual, Sec. 1790, Appendix 5) in order to support a Finding of No Significant Impact (Tables 3-1, 3-2). The second part of this chapter describes the effect of the alternatives on the Major Issues identified in Appendix A to allow the Field manager to make an informed decision. The remainder of the chapter describes the affected environment and environmental effects for other affected resources.

#### **3.2 Environmental Elements Review Summary**

Unless otherwise noted, the No Action Alternative is not expected to have adverse effects to these elements.

**Table 3-1: Critical Elements of the Human Environment (BLM H-1790-1, Appendix 5)**

<b>Critical Elements Of The Environment</b>	<b>Status: (i.e., Not Present , Not Affected, or Affected)</b>	<b>Does this project contribute to cumulative effects? Yes/No</b>	<b>Remarks or Environmental Effects (if not affected – why) if Affected (summary of environmental effects)</b>
Air Quality	Affected	No	Addressed in text (Section 3.12)
Areas of Critical Environmental Concern	Not Present	No	
Cultural, Historic, Paleontological	Not Present	No	
Prime or Unique Farm Lands	Not Present	No	
Flood Plains	Not Present	No	
Native American Religious Concerns	Not Affected	No	No Native American religious concerns were identified.
Threatened or Endangered Plant Species or Habitat	Not Present	No	No threatened or endangered plant species or habitats are located within the project area.
Threatened or Endangered Wildlife Species or Habitat	Affected	Yes	Addressed in text (Section 3.3.1), Wildlife Report (pp. 2-3, 6-7, 8, 9-11, 13).
Threatened or Endangered Fish Species or Habitat	Not Present	No	No threatened or endangered fish species are present in the Quartzville Watershed. The upstream boundary of the Upper Willamette Evolutionarily Significant Unit is located at Foster Dam. Fisheries Report (p. 1), Memo to File (9/10/03).
Hazardous or Solid Wastes	Not Present	No	
Water Quality (Surface and Ground) (including stream temperature, sedimentation)	Affected	Yes	Addressed in text (Section 3.10)
Riparian Zones (including structural diversity)	Affected	No	Addressed in text (Section 3.5), Riparian Report (pp. 1-4).
Wetlands	Not Present	No	
Wild and Scenic Rivers	Not Present	No	
Wilderness	Not Present	No	
Invasive, Nonnative Species	Affected	No	Addressed in text (Section 3.6), Botany Report (pp. 2, 3, 4).
Environmental Justice	Not Affected	No	The proposed action is not anticipated to have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.
Adverse Impacts on the National Energy Policy	Not Affected	No	This is not an energy project

**Table 3-2: Other Elements of the Human Environment**

Other Elements Of The Environment	Status: (i.e., Not Present , Not Affected, or list species or elements affected by this project)	Does this project contribute to cumulative effects? Yes/No	Remarks or Environmental Effects (if not affected – why) if Affected (summary of environmental effects)
Coastal zone	Not Present	No	
Fire Hazard/Risk	Affected	No	Addressed in text (Section 3.12.3)
Fish Species with Bureau Status and Essential Fish Habitat	Not Affected	No	No Bureau Sensitive species are found in the Quartzville Watershed. No effect on Essential Fish Habitat due to the distance upstream of project activities from historic chinook salmon habitat. Fisheries Report (p. 1), Memo to File (9/10/03).
Late successional and old growth species habitat and ecosystems in Late Successional Reserves, Riparian Reserves and Special Management Areas (RMP p. 5).	Not Affected	No	Project not located in LSR, Special Management Areas, or late successional/old growth Riparian Reserves. Project maintains late successional/old growth habitat.
Mining claims, mineral leases, etc	Not Present	No	
Recreation	Affected	No	Addressed in text (Section 3.3.4.)
Rural Interface Areas	Not Present	No	
Forest Health	Affected	No	Addressed in text (Section 3.3.5), Silviculture Report (pp. 1, 3-5), Wildlife Report (pp. 2, 9).
Soils (Site Productivity)	Affected	Yes	Addressed in text (Section 3.9)
Special Areas outside ACECs (Within or Adjacent) (RMP pp. 33-35)	Present adjacent to proposed units	No	No special habitats within the proposed units; two steep rocky areas adjacent to units A & B. Addressed in text (Section 3.7), Wildlife Report (pp. 2, 6, 9).
Special Status (SS) and SEIS Special Attention Plant Species/Habitat (including Survey and Manage) (RMP pages 28-33, Appendix B-1:1- B-2:4 )	Affected  Survey Results: 10 sites of <i>Sowerbyella rhenana</i> , 3 sites of <i>Otidea leporina</i> . No SS plants present.	No	Addressed in text (Section 3.6), Botany Report (pp. 1, 2, 3, 4).
Special Status and SEIS Special Attention Wildlife Species/Habitat (including Survey and Manage) (RMP pages 28-33, Appendix B-1:1- B-2:4 )	Affected  <i>Survey results:</i> 4 active red tree vole nests; 25 <i>Megomphix hemphillia</i> sites; Oregon slender salamander detected in unit C	No	Addressed in text (Section 3.7), Wildlife Report (pp. 2, 3-5, 7-8, 9, 11-12, 13, and attachment 1)

Other Elements Of The Environment		Status: (i.e., Not Present , Not Affected, or list species or elements affected by this project)	Does this project contribute to cumulative effects? Yes/No	Remarks or Environmental Effects (if not affected – why) if Affected (summary of environmental effects)
Visual Resources		Not Affected	No	Forested setting maintained Visual Resources Report (pp.3)
Water Resources	Aquatic Conservation Strategy Objectives	Affected	No	This proposal is unlikely to impede and/or prevent attainment of the stream flow and basin hydrology, channel function, or water quality objectives of the Aquatic Conservation Strategy (ACS) (EA Appendix B).
	Other water components (DEQ 303d listed stream, DEQ 319 assessment, water quantity)	Not Affected	No	The proposed action is unlikely to alter the current condition of the aquatic system either by affecting its physical integrity, water quality, sediment regime or in-stream flows. Hydrology Report
	Downstream Beneficial Uses (Salem FEIS pp. 3-9)	Not Affected	No	Table 3-5: Beneficial uses associated with streams in the project area.
	Key Watershed (ACS component 2)	Not Present	No	

### 3.3 Issues to be addressed in detail

The project has appeared in the *Salem District Project Update*, which is mailed to over 1,000 addresses. A scoping letter was mailed on April 25, 2003 to 38 potentially affected and/or interested individuals, groups, and agencies. The IDT conducted a field review of the project area on May 20, and had IDT office meetings on May 28, June 16, and August 11, 2003. The Scoping and Issue Identification Summary (Appendix A) identified five issues, all associated with Project 1, Forest Management:

1. The effects of the proposal on spotted owls and Critical Habitat.
2. The effects of new road construction.
3. The effects of the proposal on red tree voles.
4. The effects of the proposal on recreational use.
5. The effects of laminated root rot in the project area.

#### 3.3.1 The Effects of the Proposal on Spotted Owls and Critical Habitat

##### *Affected Environment*

Units A and B and their associated Riparian Reserves provide 19 acres of nesting foraging and roosting habitat, 65 acres of dispersal and marginal suitable habitat, and 76 acres of dispersal only habitat for the spotted owl. Units C, E and associated Riparian Reserves provide 102 acres of dispersal habitat for the spotted owl. Approximately 5 acres of unit B and 5 acres of unit C are non suitable habitat consisting of hardwoods, rocky areas and roads.

The South M&M area is located between two Late Successional Reserves (LSR). To the north and east are the Quartzville LSR (RO213), and its associated wilderness. This 92,400 acre reserve is an integral and important link in the predominant north-south LSR/wilderness network where the majority of dispersal between known spotted owl sites in the Cascades Range takes place. Immediately to the west of South M&M is the Whitcomb LSR (RO212). This 3,450 acre LSR is located about 2 to 3 miles to the southwest of the Quartzville LSR. Dispersal between the Quartzville and Whitcomb LSRs is through the South M&M area in the Moose Creek SWB across matrix lands. Most of these matrix lands are in Critical Habitat for the spotted owl (CHU-OR-14), including Sections 19 and 30. The majority of the Critical Habitat within the Quartzville Watershed (92 %) is contained within LSR.

From a spotted owl standpoint, Dispersal between the Quartzville and Whitcomb LSRs is the most important function of the South M&M area. As part of the BA and the Quartzville Watershed Analysis, Critical Habitat was analyzed for suitability and dispersal capabilities both inside LSR and on adjacent matrix lands outside of LSR (BA 26-28; QWA, Chp. 5, pp. 20-21). Critical Habitat in the matrix was found to be viable for dispersal of spotted owls (BA 26-28, 48; QWA, Chp.7, pp. 5-6). About two thirds of the lands between the Quartzville and Whitcomb LSRs are BLM lands. Connectivity is somewhat disrupted by the ownership pattern, but there is a contiguous connection of BLM lands across Matrix lands. Approximately 79 percent of the Critical Habitat between these LSRs functions as dispersal habitat.

Units A, B, C and E are all located within provincial home range radius (1.2 miles) of the Fool's Canyon known spotted owl site, which is located a quarter mile east of unit B. The site was apparently unoccupied from 1997 to 2002. The last time a pair was present was during 1994. Nesting has never been documented to occur at the Fool's Canyon site. In 2003, there was one response from a male spotted owl at the Fool's Canyon site. The "unmapped LSR" core area for the Fool's Canyon site is located within a quarter to half mile of unit C.

The Moose Creek historic spotted owl site and its associated "unmapped LSR" core area is located 1 mile east of unit C. The site has been unoccupied since 1995, when a single male was present. The last time a pair was present was during 1991. Nesting has never been documented at the Moose Creek known spotted owl site.

### ***Environmental Effects of Project 1***

#### **Alternative A - No Action:**

There would be no change in spotted owl habitat and no effect to spotted owls. Habitat conditions would remain as described in the Affected Environment, and continue to develop over time. Units C, E and the riparian units could take longer to develop suitable habitat conditions if left unthinned.

#### **Common to Alternatives B and C:**

This project "may affect, and is likely to adversely affect" the spotted owl due to the modification of dispersal and marginal suitable habitat.



The South M&M proposal was submitted on September 3, 2002 as part of the Biological Assessment (BA) addressing the effects of fiscal year 2003-2004 routine habitat modification projects on threatened and endangered species within the Willamette Province. Section 7 Consultation with the United States Fish and Wildlife Service (USFWS) has been completed (Biological Opinion {BO} reference #1-7-00-F-0008, dated February 27, 2003). As a result of consultation, the USFWS found that the proposal would not likely jeopardize the continued existence of the spotted owl (BO pp. 1, 45-46), and anticipates incidental take (BO pp. 1, 46-47).

The proposed timber sale area is located in Critical Habitat for the spotted owl in the Matrix. The BA concluded that the South M&M proposal would result in modification of Critical Habitat. As a result of consultation, the USFWS concluded that the proposal is not likely to destroy or adversely modify Critical Habitat for the spotted owl (BO pp. 1, 46).

Dispersal capabilities within Critical Habitat would remain above 50 percent for the foreseeable future.

In the short term, 178 acres of dispersal habitat would be altered as a result of thinning. These stands would be maintained as dispersal habitat after harvest. In the long term, canopy closures would increase and these stands could attain suitable habitat conditions within 10 to 30 years.

In the short term, 19 acres of nesting, foraging and roosting habitat and 65 acres of marginal suitable habitat would be downgraded to dispersal habitat as a result of thinning, which is within provincial home range radius (1.2 miles) of the Fool's Canyon known spotted owl site. In the long term, suitable habitat conditions would develop again in 10 to 20 years.

Although the project contributes to cumulative effects to owl habitat, less than 20 acres of nesting, foraging and roosting habitat would be downgraded and 65 acres of marginal suitable habitat would be altered. Suitable habitat conditions could be attained in 10 to 20 years as canopy closures increase. In addition, the treatment areas will be maintained as dispersal habitat after harvest.

Portions of unit C are located within a quarter mile of an "unmapped LSR" core area. This core area has been unoccupied for over five years. No impacts to the core area are anticipated as a result of this proposed thinning.

The seasonal restriction on all units would minimize the risk of disturbance if nesting spotted owls are encountered within disturbance range (0.25 to 0.5 miles) of the units.

**Alternative B:**

New roads are expected to result in slightly more fragmentation of habitat and result in canopy gaps that could impact dispersal habitat quality after treatment. Keeping new roads to minimum widths and blocking roads after treatment will be effective mitigation in the long term. It is estimated that Alternative B will affect about 10 acres of forested habitat due to new road and landing construction. Of the ten acres, eight acres are dispersal habitat and two acres are marginal suitable habitat.

**Alternative C:**

Less than 1000 feet of new roads would be constructed under Alternative C. Canopy closures are expected to be more contiguous after treatment. Thus, fragmentation of the habitat due to new road construction is expected to be less and dispersal habitat quality in the vicinity is expected to be slightly better than under Alternative B.

It is estimated that less than 5 acres of forested habitat would be affected as a result of new road construction and helicopter landings under Alternative C, which is about half of that which would occur under Alternative B.

***Environmental Effects of Project 2***

As a result of decommissioning 1,200 feet of existing road under both alternatives, approximately one acre in Critical Habitat would be restored to forested habitat in the long term.

**3.3.2 The Effects of New Road Construction**

***Affected Environment***

The Quartzville Creek watershed has an existing road density of four miles per section when viewed across all ownerships. The road density when considering only federally managed lands is 3.35 miles per section. The road densities for the two sections where proposed activities under this EA are planned are consistent with the watershed and have eight miles of road within the two sections on all ownerships.

***Environmental Effects of Project 1***

**Alternative A:**

There would be no change to the existing road network, as no additional roads would be constructed.

**Alternative B:**

This alternative would construct approximately 17,520 feet of new road (3.3 miles). The area cleared for these roads would be the approximately ten acres. These roads may be surfaced with pit run rock and would not become part of the permanent road network. All of the new roads would be blocked after completion of this project. Future forest management may exercise options to reopen and recommission roads constructed under this project. In addition to the new road construction it is anticipated that there would be three helicopter log landings and one helicopter service landing utilized.

***Impacts to Wildlife:*** Since any new roads constructed would be blocked there would be no impacts to wildlife due to increased traffic or harassment. There would be slightly more fragmentation of habitat and result in canopy gaps that could impact habitat quality, but keeping new roads to minimum widths will be an effective treatment in the long term. There would be a loss of approximately eight acres of mid seral and two acres of early mature habitat lost to road clearing.

**Impacts to Soils:** Constructing 17,520 feet of new road will result in loss of top soil and compaction of sub-soil on approximately 10 acres of forested land and convert it to non-forest, (about 5% of the treated area). Soil physical and chemical properties will be altered to contact with bedrock (varies with depth of soil): bulk density will be increased, water infiltration and holding capacity reduced and surface texture altered with the addition of a lift of quarry rock. The ability of these soils to support plant growth will be severely restricted, but not eliminated, for the life of the road.

**Impacts to Hydrology:** New road construction would result in direct hydrologic effects to the surfaces altered by road construction. In these locations, rainfall interception and routing of surface and subsurface water would be altered for the life of the road. The spatial extent, and potential for contributing to a watershed scale cumulative effect, of new road construction would vary with the position of the road surface in the environment and the quantity of soils and vegetation disturbed at the site.

Roads constructed on flat surfaces disturb less of the sub-surfaces and thus have little or no effect on sub-surface or groundwater flow. Intercepted rainfall on these roads is drained to adjacent soils where it quickly infiltrates the soil. Under these circumstances, road construction has a low risk of indirectly or cumulatively altering watershed hydrology or peak flows.

All new road construction would occur outside of riparian reserves on low to moderate slopes with stable surfaces emanating from the existing road network. The risk of road related landslides in these locations is minimal. No additional stream crossings would be constructed and road surfaces would be designed to efficiently drain surface water to adjacent slopes where it would infiltrate into the soil and groundwater.

Since new roads will not likely intercept ground water and will not be routing surface drainage to stream channels, they are unlikely to result in an extension of the stream network, to have any effect on watershed streamflow or peak flows; or to provide additional opportunities for road sediment from fill failures or ditch-line run-off to enter stream channels.

All road construction would utilize the Best Management Practices (BMPs) required by the Federal Clean Water Act (as amended by the Water Quality Act of 1987) to reduce non-point source pollution to the maximum extent practicable. BMPs recognize and make use of the fact that, although road construction does lead to an inevitable increase in sediment available for erosion, without *pathways* or mechanisms for that sediment to enter streams, it will not affect water quality. Improvements of existing roads would occur during the dry season. Reconstruction and drainage improvements on these roads should help reduce any risks to water quality and watershed hydrology that these roads currently pose.

**Impacts to Vegetation:** As stated above, approximately ten acres of forestland would be converted to road surface and/or road clearing area. This is equivalent to 0.01 % of the watershed. There is a slight possibility of an increase in the populations of noxious weeds along the newly constructed roads although cleaning construction equipment and blocking the roads after use will largely mitigate this possibility.

***Cumulative Effects:*** Road construction under this alternative would raise the total amount of road within the watershed to 589 miles. The road density for the 95,468 acre watershed would be 3.95 miles per section, an increase of 0.02 miles per section. Since the roads would be blocked after use, there would be no effective change in density of open roads.

**Alternative C:**

This alternative limits road construction to short spur roads, each up to 200 feet in length, totaling approximately 1,000 feet. In lieu of road construction, more of the area would be helicopter logged with potentially nine helicopter log landings and one service landing identified.

***Impacts to Wildlife:*** Less than 1000 feet of new roads would be constructed under Alternative C. Canopy closures are expected to be more contiguous after treatment. Thus, fragmentation of habitat due to new road construction is expected to be less and habitat quality in the vicinity is expected to be slightly better than under Alternative B.

It is estimated that less than 5 acres of forested habitat would be affected as a result of new road construction and helicopter landings under Alternative C, which is about half of that which would occur under Alternative B. Open and total road densities in the Moose Creek and Whitcomb Creek SWB would remain approximately the same.

***Impacts to Soils:*** Constructing approximately five helicopter landings and one service landing, in place of new road construction, would result in loss of top soil and compaction of sub-soil on approximately five acres of forested land and convert it to non-forest, (about 2.5% of the treated area). Soil physical and chemical properties will be altered to contact with bedrock (varies with depth of soil): bulk density will be increased, water infiltration and holding capacity reduced and, where rock is added, surface texture altered. The ability of these soils to support plant growth will be severely restricted, but not eliminated, for the life of the landing and any spur roads constructed to access landings.

***Impacts to Hydrology:*** Effects to hydrology, stream channels and water quality under this alternative would be very similar to those described above under Alternative B. Since Alternative C would reduce the number and length of newly constructed roads, there would be a slight reduction in the risk of new road construction contributing directly or cumulatively to alteration of the watershed hydrology and water quality, relative to Alternative B. This risk is already low, as described in the preceding section. As in Alternative B, and for the same reasons described above, the new road construction and road renovation proposed in this alternative is unlikely to result in measurable changes to watershed hydrology or water quality.

***Impacts to Vegetation:*** Since Alternative C includes fewer roads, impacts from the spread of noxious weeds along road sides would be expected to be less than could occur under Alternative B.

***Cumulative Effects:*** Road construction under this alternative would not raise the total amount of road within the watershed. The road density for the 95,468 acre watershed would remain at 3.93 miles per section.

### **3.3.3 The Effects of the Proposal on Red Tree Voles**

#### ***Affected Environment***

The candidate areas proposed for thinning are considered to be suitable habitat for the red tree vole. Survey Protocol for the Red Tree Vole, dated February 18, 2000 and the subsequent Management Recommendations for the Oregon Red Tree Vole, dated September 27, 2000, provide guidance for surveying and managing known nest sites. Surveys to protocol were conducted during March through May 2000. Thirty-one trees with nest structures were located and climbed. Four active red tree vole nests were found in unit B; and 1 inactive and 2 active nests were found in unit F. Unit F has since been dropped from the proposal. No red tree vole nests were found in units C, D, E or G.

#### ***Environmental Effects of Project 1***

##### **Alternative A - No Action:**

There would be no effect on red tree voles or their habitat. In the short term, habitat conditions would remain as described under Section 3.4, Timber, Stand Structure and General Vegetation, Affected Environment, and continue to develop over time.

##### **Common to Alternatives B and C:**

The red tree vole nests located adjacent to unit B will be protected with a minimum of a 10 acre contiguous Habitat Area, maintaining at least one site potential tree height between nest trees and the Habitat Area boundary. The red tree vole reserve associated with the Riparian Reserve on the west side of unit B is estimated to be 13 acres in size. The red tree vole reserve in the southeast portion of unit B is estimated to be about 25 acres in size. Both reserves include the best habitat surrounding the nest trees. The reserves as designed will adequately protect red tree voles in these units.

Protocol surveys resulted in no nest trees identified in units A, C and E. Suitable habitat for red tree voles that were not detected may be degraded as a result of canopy closure reductions below 60 percent.

Riparian Reserves and areas dropped or not included in the proposal would continue to provide habitat for red tree voles. Areas dropped adjacent to units A and B include old growth remnants and stands which are excellent habitat for red tree voles. In addition, units F and G which were dropped from the proposal contain some of the best red tree vole habitat in the area. Red tree voles would continue to have high quality habitat in the area, and their existence not threatened.

##### **Alternative B:**

New roads are expected to result in slightly more fragmentation of red tree vole habitat and result in canopy gaps that could impact habitat quality after treatment. Keeping new roads to minimum widths and blocking roads after treatment will be effective mitigation in the long term.

**Alternative C:**

Less than 1000 feet of new roads would be constructed under Alternative C. Canopy closures are expected to be more contiguous after treatment. Thus, fragmentation of the red tree vole habitat due to new road construction is expected to be less and habitat quality in the vicinity is expected to be slightly better than under Alternative B.

***Environmental Effects of Project 2***

Approximately one acre of red tree vole habitat would be restored in the long term.

**3.3.4 Recreation / Rural Interface**

***Affected Environment***

**Recreation:**

No sensitive recreation resources or concerns were identified in this area in the Quartzville Watershed Analysis, which was completed in September of 2002. All of the proposed units are characterized by a forest setting and are accessed by gravel forest roads. Evidence of man-made modifications such as roads and timber harvest are common on both private and public lands in the general area around the units. Timber harvest activities are likely to continue on private and public forest lands in the vicinity of the units. There are no developed recreational facilities within or near any of the units. Recreational use of the units appears to be moderate with some of the units having fire rings and litter at the end of spur roads indicating dispersed camping activity. There is also dispersed camping between Quartzville Road and Green Peter Reservoir to the south of the units.

Other recreational activities that may occur include hunting, target shooting, hiking, and horseback riding. Off-road use by motorized vehicles was not evident in any of the units. The routes used to haul timber all feed onto Quartzville Road, which is a National Back Country Byway. This is a paved road frequently used by recreational traffic during the peak use season from mid-May through mid-September.

**Rural Interface:**

None of the proposed units are in a Rural Interface Area or near residential property.

***Environmental Effects for Project 1***

**Alternative A - No Action:**

With the exception of unexpected changes (i.e. wildfire or disease), the proposed units would continue to provide a forest setting for dispersed recreational activities. A short-term increase in log truck traffic, or other disturbances related to the harvest of the units would not occur. Log truck traffic from other lands in the vicinity would most likely still occur.

**Common to Alternatives B and C:**

Recreational use of the proposed units would be restricted in the short term during the thinning operation. If the units proposed for helicopter logging are harvested during the peak use season, some dispersed campsites (five to ten campsites total) along Quartzville Road may also need to be temporarily closed for safety. Roads in the project area may need to be temporarily closed for safety. Campers at sites in the vicinity of the units that are not closed may still experience some noise disturbance. These effects would be short term in nature (months).

After harvest, a forest setting would still be maintained, and understory vegetation disturbed by logging activities would be expected to return within five years or sooner. The thinning of the units would open up the stand, which may make it more desirable to some. The proposed gating of several roads during the regulated use period for fire for the five years following harvest would reduce motorized access to those areas. Motorized access to the general area would still be possible on remaining roads, so no change is needed to the area's Off-Highway Vehicle (OHV) designation which is "Limited to Existing Roads and Designated Trails."

***Cumulative Impacts:*** Project 1 would contribute towards a slight increase in logging truck traffic along Quartzville Road.

***Environmental Effects for Project 2*****Alternative A - No Action:**

Motorized use of the roads proposed for decommissioning would still be possible as long as other factors affecting use (i.e. vegetation growth, road failure) do not occur.

**Common to Alternatives B and C:**

All of the roads proposed for decommissioning are short spur roads. As a result of this action, roads would no longer be available for use by motorized vehicles under the current OHV designation for the area, which is "Limited to Existing Roads and Designated Trails."

Motorized access to the general area would still be possible on remaining roads, so no change to the current OHV designation is needed.

***Cumulative Impacts:*** Project 2 would contribute towards a reduction of public motorized access on BLM administered lands.

**3.3.5 The Effects of Laminated Root Rot Infections in the project area*****Affected Environment***

Laminated root rot infections were found at two locations in unit A and several locations in unit B. The most severe infections are located on the west boundary of unit A and the southeast portion of unit B. Canopy closure is reduced because of Douglas-fir mortality, many trees are down and perimeter trees show signs of infection such as fading, thinning crowns, and reduced terminal growth. These openings are not functioning the same as the surrounding forest habitat because of the reduced canopy (less than 20% in some cases), and they are located within visually sensitive areas where maintenance of canopy cover is recommended.

These laminated root rot infections provide standing dead and down coarse woody debris (CWD) in early stages of decay in stands where this type of material is relatively scarce.

### ***Environmental Effects of Project 1***

#### **Common to all Alternatives:**

- The untreated infection areas will continue to expand and get larger over time. The disease spreads at a rate of approximately 2 feet per year. In 10 years what could be treated with a 3 acre opening now would require a 3.6 acre opening to treat.
- Several acres of infection areas where dead trees and blowdown are present would not be salvaged at this time. As a result, Douglas-fir beetle may increase and cause mortality in adjacent stands.
- The existence of laminated root rot infection areas in units A and B has provided some large standing snags and down CWD in early decay classes. If these areas are left untreated, they will continue to slowly expand and contribute to stand diversity in the area by providing a source of additional standing dead and down CWD in the early stages of decay. This will provide additional foraging and nesting opportunities for wildlife species which key into these structures.

### **3.4 Timber, Stand Structure and General Vegetation**

#### ***Affected Environment***

##### **Common to All Units**

All of the proposed units are second growth stands ranging from 50 to 130 years of age exhibiting varying mid-seral stage to early mature vegetation characteristics. The understories consist primarily of vine maple, bigleaf maple, western hemlock, and huckleberries, sword fern, bracken fern, salal, and Oregon grape.

##### **Units A and B**

Units A and B are natural stands of fire origin probably following a major stand replacement fire during the late 1800's or early 1900's. Currently, these stands are mid seral to early mature that vary in age from 65 to 95 years, with a minor component 100 to 130 years of age. Portions of unit A and most of unit B were thinned during the late 1960s and 1970s, which simplified stand structure, species composition, and spacing. Most of unit A and the steeper portions of unit B have not been thinned. The overstory consists primarily of Douglas-fir. There is a component of hardwoods consisting of bigleaf maple with some golden chinquapin and red alder. There are a few scattered old growth trees and a larger mature second growth tree component in unit A and the eastern portions of unit B. There are low levels of large standing dead and down CWD present in the advanced stages of decay from the previous stand. The existence of some laminated root rot has provided some large standing snags and down CWD in early decay classes. Generally, there is a shortage of large snags and CWD in these stands, especially in the early stages of decay.



### **Units C and E**

These units were clearcut logged using ground based equipment approximately 50 years ago. Stocking levels are high because no management has taken place within these stands since the original harvest. These units are a 1949 timber type and were clearcut logged using ground based equipment. They have had no past management since their origin, and stocking levels are high as a result. Canopy closures average over 80 percent, and suppression mortality is evident as inter-tree competition occurs. The understories and ground cover are sparse and under developed. The overstory consists of Douglas-fir and western hemlock. There is a moderate component of hardwoods consisting of bigleaf maple, red alder and cherry. There are no old growth remnants in units C and E. Large standing dead snags are very scarce in unit C and E, but there are moderate to high levels of large CWD present in the advanced stages of decay from the previous stand.

### ***Environmental Effects of Project 1***

#### **Alternative A - No Action:**

The stands would continue to grow but at a reduced rate. These units would become more single storied as suppressed trees in the lower canopy levels die out. Individual tree growth would slow down. Less light would reach the forest floor, reducing the quantity and diversity of understory vegetation. These stands would enter Culmination of Mean Annual Increment (CMAI) faster than if they were treated.

Due to past management in these stands, much of the material that would have developed into snags and CWD has been removed. Deferring snag creation and topping treatments would preclude an opportunity to create more standing dead, CWD, and tree deformities in future stands.

Large diameter material over 20 inches would be recruited over decades, and snags and CWD would be generated over long periods of time. Existing material would remain intact, but continue to decay.

#### **Common to Alternatives B and C:**

This proposal would increase the growth rates of residual trees remaining after thinning. This would result in larger, healthier trees with fewer stems per acre. CMAI would be delayed as growing space is reallocated to residual trees. The wider spacing of the residual trees would result in increased growth of understory trees and shrubs, which would provide better vertical canopy layering.

Some damage can be expected to residual trees from logging operations. Scraping of bark and damage to roots can be expected in or near yarding trails. Some damaged trees are considered desirable as this would create standing dead, CWD, and allow decay and deformities, thus increasing stand level diversity.

In the short term, existing snags and CWD habitat would be retained as much as possible, however direct impacts due to logging and site preparation activities are anticipated. Pile and burn methods are expected to minimize damage to snags and CWD due to burning. Most of the pile and burn activities will take place in landing locations.

In the long term, green tree retention, CWD recruitment, topping and base girdling to create snags and CWD would introduce this type of material, thus increasing stand structure for the future life of these stands. Snag densities and CWD levels would approach Northwest Forest Plan (NFP) standards over time. The risk of bark beetle attack to residual green Douglas-fir is considered to be low because of the small scale of this proposal and the use of western hemlock for snag creation as well as Douglas-fir (Hostetler 1996). Recommended design features and mitigation measures to protect the few old growth green trees and early decay class snags include posting remnants outside of unit boundaries, and pile and burn site preparation methods. These recommended design features and mitigation measures are expected to be effective in preventing the loss of green old growth trees, and minimize the loss of early decay class snags.

**Alternative C:**

Helicopter yarding under alternative C is expected to result in fewer direct impacts to CWD and residual green trees than cable yarding under alternative B. The resulting slash is expected to be more contiguous and the understory less disturbed than would occur with ground based or cable systems.

### **3.5 Riparian Reserves**

#### ***Affected Environment***

Riparian Reserve widths are one site-potential tree height for non-fish bearing streams and wet areas larger than one acre (Table 3-3). There are no fish-bearing streams in the project area.

**Table 3-3: Riparian Reserve Width by Unit**

Unit	A	B	C	E
Feet	220	200	200	200

**Common to All Units:**

All of the proposed riparian units are second growth stands exhibiting varying mid-seral stage vegetation characteristics. Stand structure, composition and diversity are similar to the upland vegetation that was simplified through past logging operations. Decadence is limited to only a few scattered snags typically no taller than twenty feet and in an advanced stage of decay. Large CWD is not locally abundant. The understories consist primarily of vine maple, bigleaf maple, western hemlock, and huckleberries. Sword fern, bracken fern, salal, and Oregon grape dominate the ground cover.

**Riparian Reserves Associated with units A and B**

The overstory associated with these Riparian Reserves was naturally regenerated and is approximately 70 to 85 years of age. It is a uniformly stocked conifer type that was commercially thinned in 1972.

This thinning was from below, and as such, most of the suppressed and intermediate trees were targeted for removal. This included most merchantable minor species present such as western hemlock and western redcedar as well as trees exhibiting deformities, standing snags and CWD. The result is a stand structure that has been simplified in horizontal spacing diversity, vertical canopy layering, species composition, and in terms of decadence present.

#### **Riparian Reserves Associated with units C and E**

The overstory associated with these Riparian Reserves is typed as 1949 Douglas-fir/western hemlock. It was initiated following the clearcut logging of old-growth Douglas-fir that formerly occupied the site and contains a pretty even mix of both Douglas-fir and western hemlock, with an occasional western redcedar and pacific yew. Bigleaf maple and red alder are also a part of the overstory. Stand exam data indicates that the stand is thickly stocked and is experiencing growth losses and suppression mortality.

### ***Environmental Effects of Project 1***

The effects are similar to those described under Section 3.4, Timber, Stand Structure and General Vegetation, with the following additions and modifications:

#### **Alternative A - No Action:**

Deferring treatment proposed for Riparian Reserves associated with units A and B would preclude an opportunity to establish horizontal spacing diversity in an overstory simplified by past thinning, and initiate a more diverse understory.

Crown space is currently limited and present live crown ratios will continue to decline as lower branches die off from lack of light and growing space. The gap between the live crowns and the understory would continue to widen, resulting in more single story stands.

Deferring treatment proposed for Riparian Reserves associated with units C and E would preclude the opportunity for introducing more diverse vegetation attributes and reduce options for future management. These stands would remain uniformly stocked with poor horizontal spacing diversity. Understory development would remain slow with minimal conifer regeneration and canopy layering and stand level diversity will continue to decline. Growth rates of the dominate trees and their crowns would remain slow.

#### **Common to Alternatives B and C:**

The variable density thinning (VDT) would be designed to impart spacing variability and overall thinning intensity would be varied to help create a more complex forest structure. This treatment would promote residual tree growth, complex crown structures, and understory development. It would maintain the mix of existing species composition and enhance existing complexity and local biological diversity.

### ***Environmental Effects of Project 2***

#### **Alternative A - No Action:**

Approximately 1,200 feet of existing road in Riparian Reserves would remain as non forest in the transportation system to provide access.

### **Common to Alternatives B and C:**

Decommissioning 1,200 feet of road would reduce access to treatment areas for future stand management purposes. Approximately one acre in Riparian Reserve would be restored to forested habitat in the long term.

## **3.6 Botany**

### ***Affected Environment***

Stand characteristics, vegetation, remnants, standing dead and CWD are described under Timber, Stand Structure and General Vegetation (Section 3.4).

### **Special Status, Special Attention, and Other Species of Concern:**

For complete lists of botanical species found at South M&M see *Biological Evaluation for Special Status Plant Species/Survey and Manage Species and Noxious Weeds* (DiGiacomo, 1999). The project area was surveyed according to established protocols with the following results:

***Special Status Species:*** No Special Status Species were identified during any of the field surveys.

***Special Attention Species (Survey and Manage):*** Ten sites of *Sowerbyella rhenana* and three sites of *Otidea leporina* were found. *Sowerbyella rhenana* is a Category B Survey and Manage Fungi, and *Otidea leporina* is a Category D Survey and Manage Fungi.

***Other Species of Concern (Noxious Weeds):*** Noxious weeds found were Canada thistle (*Cirsium arvense*), St. Johnswort (*Hypericum perforatum*) and Tansy ragwort (*Senecio jacobea*). The weed species found are common in roadside flora.

### ***Environmental Effects of Project 1***

Environmental effects to stand characteristics, vegetation, remnants, standing dead and CWD are described under Timber, Stand Structure and General Vegetation (Section 3.4).

**Alternative A - No Action:** There would be no effect on Special Attention (Survey and Manage), or other plant species of concern ("B" designated noxious weed species). Habitat conditions would remain as described in the Affected Environment (Section 3.4).

### **Common to Alternatives B and C:**

***Survey and Manage:*** Known sites of *Otidea leporina* and *Sowerbyella rhenana* have been buffered with a no entry buffer of 50 to 200 feet. With the recommended mitigation Alternatives B and C are not expected to adversely affect the known sites of *Otidea leporina* and *Sowerbyella rhenana*.

***Noxious Weeds:*** An increase in the overall number of ODA "B" designated weed species is likely to occur immediately following any ground disturbing or light increasing activity

associated with alternatives B and C. Weedy species would likely diminish rapidly as the remaining overstory increases.

Populations would persist longer along the roads and around landings due to more frequent disturbances and higher light levels for longer periods of time than in surrounding forest stands, but in time populations would decline to low levels as the canopy closes and native vegetation returns. The Timber Management and Riparian Thinning activities proposed in Alternative B are not expected to adversely increase noxious/exotic weeds beyond controllable levels.

### **Alternative C:**

***Survey and Manage:*** Alternative C would reduce soil disturbance and compaction within the project area, maintaining more acres of potential habitat for Survey and Manage species found within the project area.

***Noxious Weeds:*** Since Alternative C includes fewer roads, impacts from the spread of noxious weeds along road sides would be less than could occur under Alternative B.

## ***Environmental Effects of Project 2***

### **Survey and Manage Species:**

Road blocking and decommissioning would have no effect on current sites of *Sowerbyella rhenana* and *Otidea onotica*. Blocking and decommissioning roads could prevent future disturbance of current Survey and Manage sites or protect inadvertent loss of potential habitat due to off road vehicle use.

### **Noxious Weeds:**

Road blocking and decommissioning would have no effect on populations of ODA “B” designated weeds. The seeding/planting of native vegetation on roads which are decommissioned would re-establish desirable vegetation limiting infestation of noxious weeds.

## **3.7 Wildlife**

### ***Affected Environment***

**Upland Wildlife Habitat:** Stand characteristics, vegetation, remnants, standing dead and CWD are described under Timber, Stand Structure and General Vegetation (Section 3.4). Approximately 20 acres of units A and B proposed for thinning are late successional habitat. An additional 65 acres are early mature and marginal late successional habitat. Currently, federal lands are above the 15 percent late successional guideline with 60 percent of the watershed in late successional habitat.

**Special Habitats:** There are no special habitats within the proposed units. There is one special habitat (steep rocky area, with bigleaf maple, golden chinquapin, madrone and old growth Douglas-fir) adjacent to the southwest portion of unit A. In addition, there is one small (<1 acre) rocky brush area located on the south edge of unit B.

**Special Status, SEIS Special Attention, and Other Species of Concern:** See Special Status/Special Attention Species list for habitat description and species occurrence in the vicinity of the proposal (Attachment 1 of the Wildlife Report).

#### Federally Listed Species

***Northern spotted owl:*** The spotted owl and Critical Habitat are addressed in Section 3.3.1.

***Bald Eagle:*** The Green Peter Peninsula bald eagle nest site is located approximately ½ to ¾ miles south of the southern tip of unit B. The pair fledged young in 1995, 1997, and 2002. Even though the nest tree is considered to be outside of disturbance range (> ½ mile), it is visible from the proposed helicopter landing in the southern portion of unit B.

#### Bureau Sensitive, SEIS Special Attention, and Other Species of Concern

***Amphibians:*** Amphibian surveys were conducted concurrently with mollusk surveys. Several species were found, including the Oregon slender salamander, which is a Bureau Sensitive species. The Oregon slender salamander prefers CWD in advanced stages of decay, which is lacking in most of the units. The highest levels of CWD in advanced decay classes are present in units C and E, where there are moderate to high levels of this type of material. Oregon slender salamanders have been documented to occur in unit C.

The Cascade torrent salamander, the tailed frog, and the red-legged frog are three aquatic species of Bureau Assessment amphibians which are suspected or documented to occur in the South M&M area.

***Bats:*** Four species of bats which are listed as Protection Buffer and/or Bureau Tracking species could potentially be present in the project area. These species are associated with caves, mines, bridges, buildings, cliff habitat, or standing cull and snags. General habitat surveys were conducted during the spring/fall of 2001, and the spring of 2003. No caves, mines, bridges, buildings or suitable cliffs were found. Therefore, there are no structures that would require buffer protection under this project. There are snags and standing dead trees that provide suitable habitat for bats, however, this resource is very scarce in these managed, mid to early mature stands.

***Goshawk:*** The goshawk is a Bureau Sensitive species which prefers older forests with dense canopy closures at higher elevations. The proposed units are located at lower elevations. The habitat in the vicinity of the units is marginally suitable for goshawks. There were no observations of goshawks during surveys of the South M&M area.

***Red tree vole:*** Red tree voles are addressed in Section 3.3.3.

***Mollusks:*** Surveys were conducted for mollusk species in compliance with the Survey Protocol for Terrestrial Mollusk Species for the Northwest Forest Plan Version 2.1 dated 10/98. A total of 375 acres were surveyed. The only species found that is currently a Survey and Manage species was *Megomphix hemphilli* (MEHE), the Oregon Megomphix snail. A total of 25 MEHE sites were confirmed throughout the survey area. MEHE were located in units A, B, C, F and G. Units F and G were dropped from this proposal. MEHE meets the four criteria for locally common in unit A.

**Road Densities:** Road densities are addressed in Section 3.3.2.

### ***Environmental Effects of Project 1***

**Upland Wildlife Habitat:** Environmental effects to stand characteristics, vegetation, remnants, standing dead and CWD are described under Timber, Stand Structure and General Vegetation (Section 3.4).

**Alternative A - No Action:**

Natural processes would continue, and competition among overstory trees would continue. There would be no effect on Special Status, Special Attention, or other species of concern. There would be no changes to late successional habitat and road densities in the South M&M area. Habitat conditions would remain as described in the Affected Environment (Section 3.4).

**Common to Alternatives B and C:**

**Special Habitats:** Maintaining a 50 to 100 foot no entry buffer around the rocky areas adjacent to units A and B, and maintaining more than 40 percent canopy closure of the surrounding stands is expected to adequately protect them from impacts.

**Special Status, SEIS Special Attention, and Other Species of Concern:** The South M&M proposal is not expected to result in a trend toward federal listing, loss of population viability, or elevation of status to any higher level of concern.

### **Federally Listed Species**

***Northern spotted owl:*** The effects to spotted owls and Critical Habitat are addressed in Section 3.3.1.

***Bald Eagle:*** With a seasonal restriction on helicopter operations in the southern portion of unit B, no impacts to bald eagles are anticipated. The entire project area is over ½ mile from the known bald eagle nest tree.

### **Bureau Sensitive, SEIS Special Attention, and Other Species of Concern**

***Habitat:*** In the short term, retention of existing snags and CWD would reserve habitat for primary excavators, amphibians and bat species. Direct adverse impacts to snags and CWD due to logging and site preparation could have short term impacts on these species. Impacts are expected to be lower due to the scarcity of this type of material.

In the short term, some micro-habitat drying is anticipated to occur as canopies are opened up, however, micro-habitat drying is anticipated to be minimal due to the high green tree retention. There are moderate to high amounts of large CWD that are in the advanced stages of decay from the previous stand present in units C and E. Impacts to species such as the Oregon slender salamander and other species whose primary habitat is CWD in advanced decay classes are expected to be higher in these units. Designated skid trails, harvester/forwarder operations, and pile and burn methods are expected to minimize impacts to CWD.

In the long term, green tree retention, snag creation and additional CWD recruitment would contribute to habitat for primary excavators, amphibians and bat species in future stands, especially in Riparian Reserve treatment areas. Canopies are expected to develop and close within 10 to 30 years.

***Amphibians:*** No entry buffers and untreated Riparian Reserves would adequately protect aquatic amphibians such as the red-legged frog, tailed frog and the Cascade torrent salamander, and provide protection for bats which forage over open water and in riparian areas.

***Goshawks:*** Approximately 262 acres of marginal habitat for goshawks would be degraded through the reduction of canopy closures below current levels.

***Red tree vole:*** The effects to red tree voles are addressed in Section 3.3.3.

***Mollusks:*** Known sites of *MEHE* would be protected through the application of Strategy Two (unit A) and/or with buffers as necessary to maintain micro-habitat and persistence. Untreated Riparian Reserves and areas not included or left undisturbed would continue to provide habitat for mollusks. High green tree retention and crown cover from residuals would provide favorable habitat conditions in enough of the Habitat Area for continued presence of this species.

#### Cumulative Effects:

There is no regeneration harvest of late successional forest habitat planned as part of the South M&M Thinning. Commercial thinning would alter 19 acres of mature forest habitat and 65 acres of early mature marginal late successional habitat. The amount of late successional forest habitat on federal lands in the Quartzville Watershed would remain the same as before treatment, at 60 percent.

The South M&M proposal is located in two sub watershed basins (SWB) of the Quartzville Watershed. The majority of the proposal (169 acres or 62 %) is in the Moose Creek SWB, which is 60 percent federally managed. Currently, 51 percent of the federally managed lands in Moose Creek are in late successional habitat. The remainder of the proposal (103 acres or 38 %) is in the Whitcomb Creek SWB. About 40 percent of the Whitcomb Creek SWB is federally managed, of which 47 percent are in late successional habitat. The South M&M proposal includes less than one percent of the remaining late successional forest on federal lands in the Moose Creek and Whitcomb Creek SWBs. There are no other projects in the Moose Creek and Whitcomb Creek SWBs planned on federal lands that would affect late successional habitat in the foreseeable future.



**Road Densities:** The effects of Alternatives B and C to road densities are addressed in Section 3.3.2.

### ***Environmental Effects of Project 2***

Open road densities would remain approximately the same or decrease slightly as a result of decommissioning 1,200 feet of existing road under both alternatives. Approximately one acre would be restored to forested habitat in the long term.

## **3.8 Fisheries and Aquatic Habitat**

### ***Affected Environment***

Surveys for fish presence were conducted with a backpack electroshocker on May 17, 2000. None of the streams that drain the project area are fish-bearing. Most of the streams in the project area are too small and steep to support fish populations.

No anadromous fish species are present in the Quartzville Creek Watershed due to migration barriers at Foster and Green Peter Dams. No Bureau Sensitive species or species listed as threatened or endangered under the Endangered Species Act are found in the Quartzville Watershed.

**Habitat:** Streams that drain the project area are generally 1<sup>st</sup> and 2<sup>nd</sup> order headwater streams with well vegetated, stable banks. Woody debris is present in smaller size classes. Large logs found in the stream channels are generally in the later stages of decay.

### ***Environmental Effects of Project 1***

#### **Alternative A - No Action:**

There would be no direct or indirect effects to fisheries and aquatic habitat.

#### **Alternative B:**

Under the Proposed Alternative, no direct or indirect effects would occur to fish habitat. There is no fish habitat in close enough proximity to the project area to be affected by the proposed action. Potential effects of the project on fish in Green Peter Reservoir would be negligible due to the buffering effect of the reservoir. Effects of the project on habitat for aquatic species other than fish are not anticipated due to the retention of Riparian Reserves of 200 – 220 feet on each side of the streams. Riparian Reserve retention is expected to prevent disturbance of aquatic habitat. Existing shade levels would be retained and increases in sediment input to streams would be prevented.

The road construction proposed under this alternative may affect aquatic habitat, but is not expected to contribute to degradation of aquatic habitat. All of the proposed roads are on ridgetop or midslope locations with no hydrologic connections or proximity to streams or riparian areas.

All road construction, decommissioning, maintenance and renovation would be implemented to the standards described in the transportation management objectives and BMPs in the RMP.

The riparian thinning project would not adversely affect aquatic habitat due to the exclusion of ground based equipment from the Riparian Reserves, and the maintenance of a minimum 50 foot no treatment buffer. Tree selection for the commercial thinning and snag creation phases of the project would be designed to ensure that existing shade levels on stream channels would be maintained and no increase in water temperature would occur.

**Alternative C:**

Under this alternative there would be no impacts to aquatic habitat due to road construction.

***Environmental Effects of Project 2***

The decommissioning of approximately 1,200 feet of existing road would have no adverse effects on aquatic habitat. Beneficial effects, such as the potential reduction of road related sediment yield may be realized since the road segments that are planned for decommissioning are within Riparian Reserves.

**3.9 Soil Resources**

***Affected Environment***

Typical soils, within the project area, formed in colluvium derived from sedimentary or basic igneous rock. These warm soils have the following characteristics: Moderately deep to deep; moderately well drained to well drained; gently sloping to very steep; broad bench top, ridge top and side slopes of upland locations; and consist of clay loams, stony loams and gravelly loam soil types.

All proposed actions are within the identified limitations for the soils present (South M & M soils report). A complete description of all TPCC codes is contained in the RMP at Appendix C-11.

***Environmental Effects of Project 1***

**Alternative A - No Action:**

Rates and processes of soil development, nutrient cycling, and erosion will continue on their current trajectory.

**Alternative B:**

***Roads Construction:*** Effects of road construction are described in Section 3.3.2.

***Compaction and disturbance/displacement of soil as a Result of Harvesting:***

Skyline corridors usually result in light compaction of a narrow strip less than 4 feet in width. Effects on site productivity from this type of disturbance are minimal to none.

The percentage of the total project area impacted by surface disturbance and soil compaction as a result of skyline yarding and landings is estimated to be 5 acres (3% of the skyline yarding acreage). For an estimate of surface erosion, see the Water Erosion Prediction Project (WEPP) analysis under hydrology section of the EA (Hydrology Report pp. 1-22). For ground based skidding, impacts will vary depending on the type of vehicle and how it is used, how dry the soils are when heavy equipment operates on them and how deep the soils are covered with slash in the skid trails. Impacts also include the additional area used for landings. For many of the landings, equipment would operate on existing haul roads or skid trails and the additional ground would simply be used to deck logs until transport. Expect a moderate amount of top soil displacement to occur in skid trails and higher amounts of displacement at landings. Log decking areas would have minimal disturbance.

If a harvester/forwarder system is used for the entire ground based area, the percentage of the treated area impacted by surface disturbance and soil compaction would be between 3% - 8% (4-10 acres). Very little or no top soil loss should occur. Tractor landings and skid trails spaced 150 feet apart would disturb and/or compact up to 10% of the treated area (up to 13 acres). Expect a small amount of top soil loss (displacement) to occur in skid trails and at landings.

Impacts include the additional area used for landings. The degree of soil disturbance and compaction in areas where logs are sorted or decked is expected to be low. Areas where equipment turns or backs around on, multiple times will experience heavy compaction and disturbance to the top soil layer.

Some of the potentially impacted acreage listed above, includes already existing, compacted skid trails from previous logging. Where practical, portions of these existing trails will be used for skid trails for this project. As a result, the amount (acreage) of new or additional harvest impacts will be less than the totals listed above, while the total area (new and existing) of impacted ground is expected to be within the total ranges listed.

***Site Productivity:*** For skyline systems, soil impacts on skyline corridors are expected to result in light compaction in narrow strips less than 4 feet in width. The trees in the project area have ample crowns, so there should be adequate slash on the ground to yard over. The effect on overall site productivity from light compaction on approximately 3% of the total area is expected to be low (probably no measurable reduction in overall yield).

Harvester/forwarder systems: Soil impacts include light to moderate compaction in two discontinuous, narrow strips less than 3 feet in width. The trees in the project area have ample crowns, so there should be adequate slash on the ground to yard over. The effect on overall site productivity from light to moderate compaction on approximately 3% of the total area is expected to be less than 1-2% reduction in overall yield.

Tractor skidding: Soil impacts are expected to result in moderate, fairly continuous compaction within the landing areas and the main approximately 10 foot wide skid trails. Impacts will be light to moderate and less continuous on less traveled portions of skid trails. The effect on overall site productivity from mostly moderate compaction on 5-10 % of the total area is expected to be less than 5% reduction in overall yield.

Operating when soils are dry and soil strength is high would reduce the amount of crushing of individual soil aggregates and resulting depth of compaction.

***Riparian Thinning:*** Some additional disturbance of surface soils would likely result from thinning in riparian reserves. Where ground based skidding with careful practices is utilized, this is estimated to be limited to less than 5% of the surface area treated.

Constructing approximately five helicopter landings and one service landing, in place of new road construction, would result in loss of top soil and compaction of sub-soil on approximately five acres of forested land and convert it to non-forest, (about 2.5% of the treated area). Soil physical and chemical properties will be altered to contact with bedrock (varies with depth of soil): bulk density will be increased, water infiltration and holding capacity reduced and, where rock is added, surface texture altered. The ability of these soils to support plant growth will be severely restricted, but not eliminated, for the life of the landing and any spur roads constructed to access landings.

### ***Environmental Effects of Project 2***

The blocking of roads after completion of logging will reduce erosion of the road surface. By preventing periodic surface disturbance by vehicular traffic, water will more efficiently flow off the road rather than being collected and channeled in vehicle tracks or ruts.

Litter will begin to accumulate and some plant growth will begin on the road surface. This will further stabilize the fine textured material in the road surface and provide additional canopy cover over the road, reducing soil particle detachment from direct rainfall impact.

## **3.10 Hydrology**

### ***Affected Environment***

#### **Project Area Precipitation and Basin Hydrology**

The project area is located in the Oregon Western Cascades range at elevations between 1,000 – 2,200 feet. Portions of the project area are subject to rain on snow events (ROS) that have the potential to increase peak flows during winter or spring storms. All streams in the area drain to the Green Peter Reservoir. The fifth field watershed is Quartzville Creek, tributary to the South Santiam river fourth field #17090006 (U.S.D.I., 1974). The Quartzville watershed is utilized as a drinking water source for the city of Sweet Home and thus the project lies within a portion of the municipal watershed. The project is not part of a key watershed.

#### **Project Area Stream Flow**

Stream-flow is typical of western Cascades streams where most stream flow occurs during winter storm events. Peak flows occur following a rapid and substantial depletion of the snow-pack during prolonged rain-on-snow periods (ROS) in the “transient snow zone,” estimated to lie between 1,500 feet and 3,000 feet elevation. The two largest peak flow events in the last century took place in 1964 and in February of 1996. Both were estimated at or above a 100 year flood return interval and both were in response to substantial snow pack melt-off.

Base-flow or low-flow occurs during late summer and early fall when mean stream discharge drops below 20% of the mean winter flow. Many small headwater channels dry up completely during this period.

### **Project Area Stream Channels**

There are several perennial headwater streams adjacent to the proposed treatments. Perennial streams have been classified as step-pool channels: “Step-pool morphology generally is associated with steep gradients, small width to depth ratios, and pronounced confinement by valley walls.” The remaining channels adjacent to the proposed treatment units are small with intermittent or ephemeral flow. All the channels viewed in the field are currently in “proper functioning condition” (U.S.D.I., 1993).

### **Project Area Wetlands:**

Two wetlands were identified in the project area. One small pond is located at the junction of the main roads in Unit C. This pond was created by road construction, to provide a source of water for fire control. The other two ponds are in a complex of flat, wet sites at the top of a stream in unit B and are natural.

### **Project Area Water Quality**

The water quality parameters with the potential to be affected by this proposal include stream temperature, dissolved oxygen (DO) concentrations, hydrogen ion concentration (pH), and turbidity.

***Stream Temperature:*** The Quartzville Watershed Analysis (BLM, 2002) indicated that summer stream temperatures in the watershed’s main channel are above the State of Oregon’s threshold of 17.8 degrees C. However, this is upstream from the project area and all of the stream temperature monitoring conducted by the BLM to date has occurred outside of project area streams. No data has been collected on the two small tributaries (Johns Creek and Manzanita Creek) that flow out of the project area because they flow directly to the reservoir. Similarly, Whitcomb Creek, the main stream to the west of the project area, has not been monitored. However, due to the full forest cover on the public lands adjacent to these streams, temperatures there are likely below the state threshold and within the range of natural variation.

***Dissolved Oxygen, pH, and Conductivity:*** The Quartzville Watershed Analysis stated that high temperatures and algae blooms in portions of the main channel may be reducing DO but did not cite any data or monitoring to verify. No data for these variables in the immediate project area was located for this assessment. Considering the low stream temperatures in the project area, together with full forest cover, it is likely that DO and pH levels are within the range of natural variation and meet state standards.

### ***Turbidity and Sediment:***

The Quartzville Watershed Analysis did not specifically identify fine sediment and turbidity as an issue in the watershed, however landslides in upper Quartzville Creek were identified as important source areas for fine sediments and turbidity. In the project area, due to the low to moderate slopes, landslides are uncommon.

Oregon Department of Environmental Quality (DEQ): Quartzville Creek has been listed since 1998 for not meeting water quality standards for summer stream temperatures from river mile 3.3 -26.8 (Record ID 7254). The DEQ is currently developing a Total Maximum Daily Load (TMDL) for the South Santiam watershed. Table 3-4 shows the Or Oregon Statewide Assessment of Non-point Sources of Water Pollution.

**Table 3-4 Oregon Statewide Assessment of Non-point Sources of Water Pollution**

	Water Quality Conditions Affecting:				
Watershed (Stream Reach)	General WQ	Drinking Water	Recreation/ Shellfish	Fish	Aquatic Habitat
Quartzville (96)	M1	M1	NP	M1	M1
Unnamed Tributary (97)	M1	NP	NP	M1	M1

NP = No Problem and/or No Data, M1 = Moderate Problem with data,

The main-stem of upper Quartzville Creek (above the reservoir) has been identified as having moderate water quality problems (with data) that may be affecting general water quality, drinking water, fisheries and aquatic habitat. Types of non-point pollution were identified as excessive sediment, insufficient stream structure, and nutrients.

Beneficial uses of surface water from the project area are displayed in Table 3-5. There is one existing water right on Manzanita Creek, section 30, issued for the purpose of mining. A municipal water user (City of Sweet Home) exists on the South Santiam downstream from the project area as well as water withdrawals for domestic use, irrigation and livestock watering, all below the reservoir.

**Table 3-5: Beneficial uses associated with streams in the project area.**

Stream (Watershed)	Project Action	Beneficial Use	Distance from Project Action	Information Source
Manzanita Creek/ Moose Creek/Whitcomb creek	Timber harvest: Reductions in stand density with road reconstruction and maintenance.	Mining	< .25 mile downstream	WRIS*
		Resident fish & Aquatic Life	immediate	BLM
South Santiam	Timber harvest: Reductions in stand density with road reconstruction and maintenance	Salmonid rearing and spawning	Below reservoir	BLM
		Resident fish & Aquatic Life	Below reservoir	BLM
		Domestic, Irrigation & Live-stock watering	Below reservoir	WRIS*
		Municipal	>10 miles in South Santiam below reservoir	BLM

\* WRIS = Water Rights Information System of the Oregon Department of Water Resources

### ***Environmental Effects of Project 1***

#### **Alternative A - No Action:**

Under this alternative the existing water quality conditions, stream flows, and channel conditions at the project site would continue their current trends (see section on Affected Environment).

#### **Alternative B:**

##### ***Summary:***

Measurable direct and indirect effects to stream flow, channel function, and water quality as a result of the action alternative are of low probability. The proposed action is unlikely to alter the current condition of the aquatic system either by affecting its physical integrity, water quality, sediment regime or in-stream flows.

This proposal is unlikely to directly alter base flow or peak flow events in a measurable manner. Tree removal would not occur on steep, unstable slopes where the potential for mass wasting adjacent to stream reaches is high. Therefore, increases in sediment delivery to streams due to mass wasting are unlikely to result from this action. In addition, potential impacts resulting from tree harvest would be mitigated and, with the implementation of BMPs, are unlikely to contribute measurable amounts of sediment to streams. Riparian forest cover within fifty feet of streams is retained thereby maintaining riparian microclimate conditions and protecting streams from increases in temperature.

### ***Aquatic Conservation Strategy Objectives:***

Riparian reserves in the sale area would be established to the standards for streams and wetlands outlined in the *Salem District Record of Decision (1994)* on page 10. Where stand treatment is proposed within riparian reserves, buffers or “non-treatment zones” would be applied to all channels, wetlands and ponds in the project area. As stated above, soil disturbance would be limited to no more than 5% of the harvested area. Together with the no entry buffers, this level of disturbance has low risk for affecting water quality, channel stability or stream flow (EA Appendix B – Aquatic Conservation Strategy Review: Tables 7-1 and 7-2).

### ***Surface and Sub-Surface Hydrology and Stream Flow:***

Mean Annual Water Yield: It can be assumed that this proposal would likely result in some small increase in water yield which correlates with the removal of a portion of the conifer over-story (Hydrology Report pp. 1-22). However, other than increased peak flows (discussed below) the “increase in fall and winter discharge from forest activities is likely to have little biological or physical significance” (*U.S.E.P.A., 1991*) (Hydrology Report pp. 1-22).

#### Base Flow:

Outside of fog-drip zones, removal of the forest cover usually results in an immediate increase in summer base flow, presumably due to the reduction in evapotranspiration and interception, with a slow recover to pre-treatment flows after several years (*Harr et al., 1979*). Thus, it can be assumed that the proposal would likely result in some small increase in summer water yield which correlates with the removal of a portion of the conifer over-story.

This action could have a potential ***beneficial*** effect on the aquatic community of adjacent streams by increasing summer base flow. However, considering the small percentage of the watershed’s coniferous forest that would be altered, this effect is not likely to be measurable.

#### Peak Flow (Including Cumulative Effects):

*Forest Harvest:* A preliminary analysis for the risk of increases in peak flow as a result of forest harvest was conducted using the Oregon Watershed Assessment Manual watershed analysis methods for forest hydrology (OWEB, 1997). Table 3-6 displays the results of this analysis.



**Table 3-6: Risk of Increases in Peak Flows**

6th field Watershed Name	Historic Crown Closure in ROS Areas (%)	Percent of Watershed in ROS Areas (%)	Percent of ROS area with <30% Current Crown Closure (%)	Risk of Peak-Flow Enhancement
Lower Quartzville Creek	50-70%	60%	42%	Low
Lower Green Peter Reservoir	50-70%	60%	42%	Low

Current conditions in the South M&M project area indicate a low risk for peak flow enhancement. Since the proposed action will maintain all treated stands at no less than 40% crown closure, this proposal results in no additional risk. Even if private land owners in these watersheds were to increase the area with less than <30% crown closure, the proposed action would not be adding to this effect cumulatively. Therefore, the proposed action has a low risk for contributing to cumulative increases in peak flows in these watersheds.

*Roads:* Road surfaces have been implicated as important contributors to increased peak flows in the western Cascades (Jones et al., 1996). However, most of the roads that would be utilized under this proposal already exist. This proposal will not alter these roads in a way that would likely reduce or increase any existing effect to peak flows attributable to the current road network and thus it will *maintain* the current condition and trends relative to hydrology and stream flow. In addition, existing roads were inventoried by area specialists and recommendations for improvement and repair of road surfaces would be implemented under the proposed action. Some of these actions would reduce existing road effects on local and watershed hydrology. New road construction is discussed in Section 3.3.2 of this EA.

***Project Area Stream Channels, Wetlands, and Ponds:***

In the short term, this proposal would be unlikely to alter the current condition of channels, wetlands and ponds in the project area. Minimization of direct and indirect disturbances from the proposed action would likely result in the maintenance of stream channels and wetlands in their current condition.

Under the proposed action there would be no direct alteration of any stream channel, wetland or pond morphological feature. All operations, equipment and disturbances are kept a minimum of 50 feet from all wetlands and stream channels. In addition, the proposed action is unlikely to affect streamflow in a measurable manner and therefore any indirect effects to stream channels as a result of increases in peak flows is unlikely. Thus, the proposed action would be unlikely to result in any measurable effects, such as increases in bank erosion, channel incision, loss of floodplain connectivity or alteration of local wetland hydrology.

Over the long term, reductions in stand density would likely increase riparian and upland forest health and tree size. This could lead to increased large wood recruitment for stream channels, an important factor in proper channel function. In addition, more open stands would provide for the growth of important riparian species in the under-story, such as western red cedar, which are currently suppressed. In the project watersheds, large wood structure in the channel is particularly important because it has been depleted to levels below its natural range (BLM, 2002). Large wood in main channels would likely slow stream velocity, increase retention of organic material, capture bedload, and improve aquatic habitat.

### ***Project Area Water Quality:***

#### Stream Temperature:

Field surveys and review of aerial photographs indicate that shading is near to full potential along all the streams on public lands in the project area. Most channels in the project area have an intermittent flow regime and do not flow on the surface during most summers. Water temperature in these channels is influenced directly by soil temperature which is a function of elevation, aspect and soil type. Therefore, these channels have very little potential to be heated by exposure to direct solar radiation. Reductions in stand density in the riparian forest near these streams are unlikely to result in any measurable alteration of temperature regime. Nevertheless, all primary shade zone vegetation would be retained along intermittent streams as well.

#### Dissolved Oxygen, pH and Conductivity:

Since the proposed action is unlikely to result in any measurable increase in stream temperature or sedimentation, would not place large amounts of fine organic material in the stream and will not alter re-aeration, it is unlikely that this proposal would have any measurable effect on DO levels in project area streams. Available data indicates that most forest management activities have little effect on pH or conductivity (U.S.E.P.A., 1991). It is unlikely that the proposed action will have any measurable effect on pH or conductivity in project area streams.

#### Sediment Transport, Turbidity and Channel Substrates:

In most cases, management practices with the potential to accelerate erosion fall into three categories: road construction and hauling, timber harvest or “yarding,” and site preparation for reforestation (particularly prescribed burning).

Based on the BMPs and mitigation measures that are proposed to eliminate and/or limit acceleration of sediment delivery to streams in the project area, it is unlikely that this proposal will lead to a measurable increase in sediment delivered to streams, stream turbidity, the alteration of stream substrate composition, or sediment transport regime.

In regard to sediment, most research to date supports the conclusion that the effectiveness of riparian buffer zones for trapping sediment before it can enter a water way reaches 100% at around 150 feet, particularly for diffuse sources such as a sale unit (CH2MHILL et al., 1999). The buffers on this sale extend from 200 feet to 220 feet (slope distance). No sedimentation is expected to occur.

*Roads Construction:* All new road construction would occur outside of riparian reserves on low to moderate slopes with stable surfaces emanating from the existing road network. The risk of road related landslides in these locations is minimal. Since no additional stream crossings would be constructed, road construction in this proposal would not cause an expansion of the stream network nor would it provide additional opportunities for road sediment from fill failures or ditch-line run-off to enter stream channels. All road construction would utilize the BMPs required by the Federal Clean Water Act (as amended by the Water Quality Act of 1987) to reduce non-point source pollution to the maximum extent practicable. Improvements of existing roads would occur during the dry season. Reconstruction and drainage improvements on these roads should help reduce any risks to water quality and watershed hydrology that these roads currently pose.

*Hauling:* The main haul routes would be on rocky forest roads to the main paved surface road that accesses Quartzville Creek. In the project area, road 12-3E-29 crosses perennial streams at two locations: at the intersection with spur road 19.1 and at the detention pond in the north part of the project area. These locations are at highest risk for introducing sediment from the road surface into streams. Monitoring the water quality at these locations during hauling, together with the implementation of appropriate mitigation measures, should reduce sediment delivery to levels below the state of Oregon's water quality limits (i.e., <10% increase in stream turbidity relative to "background," as measured above project activities).

*Tree Harvest and Yarding:* Except in those specific cases where additional woody material would benefit aquatic functions, BMPs call for directional falling of trees, as well as yarding, away from streams, wetlands or ponds to reduce the risk sediment inputs into these water bodies.

All proposed treatment units are outside of any areas mapped as unstable or prone to mass wasting. Therefore, increases in sediment delivery to streams due to mass wasting induced by loss of root strength are unlikely to result from this action. In addition, the minimal levels of surface disturbance under this proposal would be unlikely to result in the concentration of runoff on mass wasting susceptible slopes.

Project design features include directional felling, and skyline yarding away from streams. The "no treatment buffers" around all streams will eliminate most disturbance of stream-side vegetation. Therefore, it is unlikely that this proposal will increase bank erosion or channel cutting by altering channel roughness, redirecting flows or altering bank-stabilizing vegetation.

The proposed skyline units C#122a and C#122b along the south side of the perennial stream was analyzed for potential sediment delivery to the stream. This area currently has an estimated 40% "probability" of sediment delivery in any given year with an "average" quantity of delivered sediment estimated at 0.07 tons/acre/yr. Under the proposed alternative (includes thinning in the riparian reserve with a fifty foot "no entry buffer"), harvesting and yarding would not increase the probability of sediment delivery but would increase the average amount to 0.15 tons/acre/yr. Similarly, thinning only to the edge of the riparian reserve (i.e., 180 foot untreated buffer) increases average sediment delivery to 0.11 tons/acre/yr but not the probability that this will occur in any given year.

In summary, the probability or risk of surface erosion with delivery to streams following treatment would not change. The average quantity of delivered sediment would increase but remains quite small relative to total sediment yields in the watershed. Total sediment yields for small, forested watersheds in the Pacific Northwest range from 0.02 - 19.43 with a mean of 1.752 tons/acre/year (Patric, 1984). The estimated increase of 0.08 tons/acre/yr attributable to the proposed action is approximately 4.6% of mean annual yields and, given the inherent variability in sediment yield measurements, is not a measurable effect. The probability of surface erosion and delivery of sediment would drop back to current levels within three to five years.

*Riparian Thinning:* In the short term, harvesting of trees from the riparian would likely increase the “average” quantity of sediment delivered to streams but would not increase the probability of this occurring in any given year. The difference between thinning within reserves and only thinning in the uplands is not a measurable quantity. Nevertheless, additional mitigation measures would be implemented to reduce this quantity to a minimum. It is unlikely that the action would result in large quantities of sediment reaching the stream because disturbance to surfaces would be <5% of the area, slopes are low to moderate, a 50 foot minimum buffer will still be in place, the forest stand density will remain over 40%, and no site preparation will occur. Stream temperature is unlikely to be affected because the primary shade zone (<60 feet from the channel) will be unaffected. Streamflow, watershed hydrology and stream channel effects would likely remain the same as described under Project 1.

*Site Preparation:* No post treatment site preparation by broadcast burning is proposed. Some piling and burning of slash is proposed. Piles would be located on level ground outside of riparian areas on surfaces that were previously compacted (i.e., roads and/or landings). Any effects to soils and hydrology would be short term and limited to the immediate site. Pile burning would be unlikely to have any influence over water quality, stream channels or watershed hydrology.

Cumulative Effects: The proposed action may contribute cumulatively to fine sediment levels in local stream channels. The quantities and the overall risk are low as described above, with the implementation of project design features described in Chapter II.

### **Alternative C:**

Effects to hydrology, stream channels and water quality under this alternative would be very similar to those described above under Alternative B. Since Alternative C would reduce the number and length of newly constructed roads, there would be a slight reduction in the risk of new road construction contributing directly or cumulatively to alteration of the watershed hydrology and water quality, relative to Alternative B. This risk is already low, as described in the preceding section. As in Alternative B, and for the same reasons described above, the new road construction and road renovation proposed in this alternative is unlikely to result in measurable changes to watershed hydrology or water quality.

Sediment Transport, Turbidity and Channel Substrates: In addition, with the change in skyline landing options associated with this alternative, full suspension skyline would be required while yarding over streams. Helicopter yarding is planned to fully suspend logs across many riparian canopies, further reducing the risk of sediment reaching streams.

## ***Environmental Effects of Project 2***

### **Alternative B:**

The blocking of roads after completion of logging will reduce erosion of the road surface. By preventing periodic surface disturbance by vehicular traffic, water will more efficiently flow off the road rather than being collected and channeled in vehicle tracks or ruts.

However, except in cases where the road prism is actively eroding and interacting with the local stream system, this action is unlikely to have any effect on water quality, stream flows or watershed hydrology. Over the long term, recovery of vegetation on the road surface would, if left undisturbed, eventually lead to a return of pre-disturbance conditions.

The proposal includes reconstruction and drainage improvements of existing roads needed to access the project area as well as road decommissioning. This will reduce road-stream interactions with long term benefits for water quality and watershed hydrology (Madej, 2001). In conclusion, the road construction and improvements proposed are unlikely to have any measurable, short-term detrimental effect on watershed water quality and hydrology and may support improved conditions over the long term.

## **3.11 Visual Resources**

### ***Affected Environment***

A portion of Unit B falls within a Visual Resource Management (VRM) Class II category. Class II guidelines call for low levels of change and retention of the existing landscape character. Unit A and a portion of unit B fall within a Class III category. Class III guidelines call for moderate levels of change and partial retention of the existing landscape character. Portions of both units are observable from Green Peter Reservoir, Quartzville Road, Green Peter Reservoir and several campsites along Quartzville Road. Both units are also observable from a popular fishing bridge crossing an arm of Green Peter Reservoir in T. 12 S., R. 2 E., Section 25. Views while driving Quartzville Road would be very short (seconds and minutes) and views while fishing or camping would be longer (hours and days).

All of units C and D and the remainder of Unit B fall within a Class IV category. Class IV calls for moderate levels of change with the allowance for major modifications to the existing landscape character. Little or none of the units appear to be observable from major public travel routes or recreation areas.

## ***Environmental Effects of Projects 1 and 2***

### **Alternative A - No Action:**

With the exception of unplanned changes (i.e. wildfire, disease etc.) no modifications to the landscape character of the proposed units would be expected to occur.

### **Common to Alternatives B and C:**

A forested setting would still be maintained and changes to the landscape character are expected to be low and would comply with Class II, III and IV guidelines. Because the forest canopy would be maintained in the project area, no cumulative impacts to the visual resources were identified.

## **3.12 Other Resources**

### **3.12.1 Cultural Resources**

During scoping the Confederated Tribes of Grand Ronde expressed concern about ground disturbing activities, primarily road building. No concern was raised regarding tree cutting or removal. Cultural resource surveys were completed, concentrating on the most likely areas to have been used by native peoples and early immigrants. No sites of cultural value were found. Should any sites of cultural value be discovered during implementation of this project, all activity would be suspended.

### **3.12.2 Air Quality**

The closest residents to the project area are approximately seven miles away, down the Middle Santiam River. The town of Sweet Home, Oregon is at least eleven miles removed from the project area. Smoke output is expected to be of short duration. Burning would likely be done consistent with the Oregon Department of Environmental Quality Smoke Management Program under conditions favorable to rapid smoke mixing and dispersal. It is highly unlikely that any residents of these areas would be affected by residual smoke from burning piles.

### **3.12.3 Fire / Fuels Management**

#### ***Affected Environment***

Fuel loadings in the treatment areas are considered normal for young timbered stands. These present fuel loadings have a low to moderate hazard of wildfire depending on the weather for any given fire season.

Fuel loadings in Unit A and B of the project area prior to harvesting are estimated to be 10-15 tons per acre, with very little fuels in the 0.0-3.0 inch size class. After harvest fuel loadings are estimated to increase to 30-35 tons per acre with most of the increase in the 0.0-9.0 inch size classes. Fuel loadings in Unit C of the project area prior to harvesting are estimated to be 25-35 tons per acre with 3-5 tons in the 1-3" size class. After harvest the fuel loading would increase to approximately 40-45 tons per acre with 6-8 tons in the 1-3" size class.

The predominate natural ignition source for wildfire in Oregon is lightning. The sale area however, is not located in a geographical area conducive to lightning fires. It does occur rarely and is usually accompanied by sufficient rainfall to eliminate a fire start. The other source of ignition would be human related. The general area in and around the 12-3E-29 road system receives a great deal of recreational use. Historically, the heavy recreational use has not produced wildfires. There is an occasional abandoned campfire that is reported but that is the extent to which it goes. Fire suppression resources are readily available in this area.

Detection and successful initial attack of any wildfire would normally be expected before the fire becomes too large.

### ***Environmental Effects of Project 1***

#### **Alternative B:**

Piling (machine or hand), covering and burning of landing piles and any miscellaneous debris piles would remove the largest concentrations of fuels along all road systems in the sale area. Removal of landing piles would remove potential fire control problems in case of a wildfire. Machine piling and burning or hand pile and burning have a few potential negative effects. These include the elimination of the duff/litter layer; removal of organic matter and the elimination of soil structure in the upper layers of the soil A-horizon; increase soil erosion and rain compaction of the individual burn sites.

Sample Behave Plus runs (a fire behavior prediction model) show that there is greater probable fire behavior exhibited after harvest than before. The outputs from the two fuel types show that a wildfire under less than extreme conditions could be handled with hand-crews and fire equipment (dozers and engines). Using Behave-Plus to predict the size of a unimpeded fire after 2 hours shows a .7 acre fire size in Fuel Model 8 and a 5 acre fire size in Fuel Model 11.

The consequences of timber harvest and a related wildfire are more than the consequences from a wildfire in a untreated stand. Even though the fire size is estimated to be 7 times larger in the treated stand it is unlikely that a wildfire in that location would grow for two hours without suppression resources being initiated and in place within an hour or less.

The potential for lightening caused ignition would be expected to remain essentially unchanged from the present condition. The fuel reduction corridors in Sec 19 or Sec 30 would minimize the potential for any human related fire starts. All other roadbed areas associated with this timber harvest would be behind locked gates or blocked roads which would minimize recreational activities and associated potential for human related fire starts.

### ***Environmental Effects of Project 2***

Decommissioning 1,200 feet of existing road will have a beneficial effect on fire risk, both in the short and long term, due to the reduction of human intrusion and traffic. The decommissioning would have minimal effect on fire access in the South M&M area.

## **4.0 Chapter 4 – List of Preparers/Interdisciplinary Team, Consultation and Contacts**

### **4.1 List of Preparers/Interdisciplinary Team**

NAME	TITLE	RESOURCE ASSIGNED	INITIALS	DATE
Michael Barger	Forester	Sale Layout, Logging Systems	MB	10/15/03
Sam Caliva	Fuels Specialist	Fuels/Air	SC	10/15/2003
John Caruso	Soils Scientist	Soils Cultural Resources	JRC	10/17/03
Jim England	Wildlife Biologist	IDT Co-Lead, Wildlife	JE	10/14/03
Floyd Freeman	Forester	Silviculture	FF	10/18/03
Laura Graves	Recreation Planner	Visual/Recreation/Rural Interface	LG	10/15/03
Patrick Hawe	Hydrologist	Water Resources	PH	10/20/03
Randy Herrin	Forester	IDT Co-Lead, Plans, NFP Coordination	RH	10/15/03
Robert Jordan	Engineering Technician	Engineering	RJ	10/20/03
Marilyn Lowery	Botanist	Botany, Noxious Weeds	ML	10/16/03
Dave Roberts	Aquatic Biologist	Fisheries/Aquatic Resources	DR	10/14/03
Dave Rosling	Riparian Ecologist	Riparian Ecology	DR	10/20/03
Wesley Wong	Natural Resource Spec.	Maps	WW	10/14/03



## **4.2 Consultation and Contacts**

In addition to the interdisciplinary team that developed and reviewed this proposed action, the following agencies, organizations, or individuals were consulted:

American Lands Alliance  
BARK  
Shirley Brown  
Cascade Timber Services  
Cascadia Wildlands Project  
City of Albany  
City of Jefferson  
City of Lebanon  
City of Scio  
City of Sweet Home  
Confederated Tribes of the Grand Ronde  
Confederated Tribes of Siletz Indians  
Confederated Tribes of Warm Springs  
Environmental Protection Agency  
Frank Lumber  
Freres Lumber Company, Inc.  
Hampton Tree Farms  
Claire Hibler, BLM District Botanist  
Linn County Board of Commissioners  
National Marine Fisheries Service (NOAA Fisheries)  
Northwest Environmental Defense Center  
Northwest Forestry Association  
Oregon Chapter of the Sierra Club  
Oregon Department of Fish and Wildlife  
Oregon Department of Forestry  
Oregon Natural Resources Council  
Oregon Watersheds  
Oregon Wildlife Federation  
Pacific Rivers Council  
Greg Pendle  
Frances Philipek, BLM, Archeologist  
Roy Price, BLM District Wildlife Biologist  
River Network  
Bob Ruediger, BLM District Fisheries Biologist  
Karen Sjogren  
U.S. Fish and Wildlife Service  
U.S. Forest Service  
Chris West  
Weyerhaeuser, Inc.  
Eric Wilborn

## **5.0 Chapter 5 – Sources and Glossary**

### **5.1 Sources**

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Rosling, D. 2003. *South M&M EA Input: Riparian Reserves*. Cascades Resource Area, Salem District, Bureau of Land Management. Salem, OR.

This project follows direction in or is in compliance with following documents:

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## 5.2 Glossary

**Anadromous Fish** - Fish that are born and reared in freshwater, move to the ocean to grow and mature, and return to freshwater to reproduce. Salmon, steelhead, and shad are examples.

**Aquatic Conservation Strategy (ACS)** - The Aquatic Conservation Strategy was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The strategy would protect salmon and steelhead habitat on federal lands managed by the Forest Service and the Bureau of Land Management within the range of the Northern Spotted Owl. The Aquatic Conservation Strategy is designed to meet nine objectives. Compliance with the Aquatic Conservation Strategy objectives means that an agency must manage the riparian-dependent resources to maintain the existing condition or implement actions to restore biological and physical processes within their ranges of natural variability.

**Best Management Practices (BMPs)** - Those practices utilized by the Bureau of Land Management (located in appendix C of the RMP) that are intended to maintain or improve water quality and soil productivity.

**Canopy Closure** - The cover of branches and foliage formed collectively by the crowns of adjacent trees and other woody growth.

**Coarse Woody Debris (CWD)** - Tree or portion of a tree that has fallen or was cut and left in the woods to contribute to a variety of ecosystem functions. Usually refers to pieces at least 20 feet long and 20 inches in diameter at the large end.

**Commercial Thinning** - The removal of merchantable trees from an even-aged stand to encourage growth of the remaining trees.

**Concern** - A topic of management or public interest that is not well enough defined to become a planning issue, or does not involve controversy or dispute over resource management activities or land use allocations or lend itself to designating alternatives. A concern may be addressed in analysis, background documents, or procedures or in a non-controversial decision.

**Connectivity** - A measure of the extent to which conditions between late-successional/old-growth forest areas provide habitat for dispersal, and movement of late-successional/old-growth-associated wildlife species. Connectivity (CONN) is also a Federal Land Use Allocation which is considered to be part of the Matrix. CONN is designed to maintain a minimum of 25 to 30 percent late successional habitat at any given point in time. These lands are managed on a 150 year rotation with greater green tree retention than GFMA.

**Core Area** - That area of habitat essential in the breeding, nesting and rearing of young, up to the point of dispersal of the young. Most often used in conjunction with spotted owls to describe the area that includes the nest tree and/or the center of activity.

**Critical Habitat** - Under the Endangered Species Act, the specific areas within the geographic range occupied by a federally listed species on which are found physical and biological features essential to the conservation of the species, and that may require special management considerations or protection. Critical Habitat for the northern spotted owl was designated by the U.S. Fish and Wildlife Service in 1992.

**Culmination of Mean Annual Increment** - The peak of average yearly growth in volume of a forest stand (total volume divided by age of stand).

**Cultural Resource or Site** - Any definite location of past human activity identifiable through field survey, historical documentation, or oral evidence. Includes archaeological or architectural sites, structures, or places, and places of traditional cultural or religious importance to specified groups whether or not represented by physical remains.

**Density Management** - Cutting of trees for the primary purpose of widening their spacing so that growth of remaining trees can be accelerated. Density management harvest can also be used to improve forest health, to open the forest canopy, or to accelerate the attainment of old-growth characteristics if maintenance or restoration of biological diversity is the objective.

**Diameter at Breast Height (DBH)** - The diameter of a tree 4.5 feet above the ground on the uphill side of the tree.

**Endangered Species Act (ESA)** - An Act of Congress in 1973 that defines the criteria for species that are in danger of extinction throughout all or a significant portion of its range.

**Environmental Assessment** - A concise document showing a systematic process of developing reasonable alternatives; and predicting the probable environmental consequences of a proposed action and the alternatives.

**Evolutionarily Significant Unit (ESU)** - A population that is reproductively isolated from other conspecific populations and represents an important component in the evolutionary legacy of the biological species.

**Fragmentation** - Breaking up of contiguous areas into progressively smaller patches of increasing degrees of isolation.

**General Forest Management Area (GFMA)** - A Federal Land Use Allocation which is considered to be part of the Matrix. GFMA is managed on a regeneration harvest cycle of 70 to 110 years and a biological legacy of six to eight green trees per acre is retained to provide habitat components over the next management cycle.

**Green Tree Retention** - A stand management practice in which live green trees, as well as snags and large down wood, are left as biological legacies within harvest units to provide habitat components over the next management cycle.

**Interdisciplinary Team (IDT)** - A group of resource specialists who conduct the environmental assessments.

**Issue** - A major point of discussion about environmental effects of the proposed action. Issues are within the scope of a proposed action, which is used to formulate alternatives, develop mitigation measures, or is important in tracking effects.

**Land Use Allocations** - Federal allocations which define allowable uses/activities, restricted uses/activities, and prohibited uses/activities according to the various Forest and Resource Management Plans. Each Land Use Allocation is associated with specific management objectives.

**Late-Successional Forests** - Forest seral stages which include mature and old-growth age classes, generally 80 years and older.

**Late-Successional Reserves (LSR)** - A Federal Land Use Allocation which is reserved and managed to maintain, protect, and promote late successional forest habitat and associated species.

**Long Term** - The period starting 10 years following implementation of the resource management plan. For most analyses, long-term impacts are defined as those existing 100 years after implementation.

**Matrix Lands** - Federal land outside of reserves and special management areas that will be available for timber harvest at varying levels. Consists of both Connectivity (CONN) and General Forest Management Area (GFMA) lands.

**Mitigating Measures** - Modifications of actions which:

- . avoid impacts by not taking a certain action or parts of an action;
- . minimize impacts by limiting the degree or magnitude of the action and its implementation;
- . rectify impacts by repairing, rehabilitating or restoring the affected environment;
- . reduce or eliminate impacts over time by preservation and maintenance operations during the life of the action; or
- . compensate for impacts by replacing or providing substitute resources or environments.

**National Environmental Policy Act (NEPA)** - The basic national charter for the protection of the environment. It establishes policy, sets goals (section 101), and provides means (Section 102) for carrying out the policy.

**New road construction** - Construction of a road where there previously has not been a road. i.e.: no indication of an historic road bed (indicators may include: excavation scaring and human caused alteration of the topography; vegetation such as alder growing in or along the old road; indications of a rocked surface or soil compaction; or altered flow of surface water not attributed to natural causes.

**Permanent road** - Permanent roads are those roads that are used and/or not decommissioned or closed after the contract is terminated.

**Peak Flow** - The highest amount of stream or river flow occurring in a year or from a single storm event or period of snow melt.

**Road** - A transportation facility originally constructed to be used primarily by vehicles having four or more wheels. It is documented as such by the owner, and [may be] maintained for regular and continuous use (CFR 9100). The level of maintenance is generally dependent on available funding.

**Road Reconstruction or Renovation** - Work done, in varying amounts, to an existing road (bed) which restores it to a condition that meets present need and construction standard. Reconstruction may incorporate some of the following: brushing, clearing and grubbing, excavation, widening, rocking, blading, and subgrade compaction.

**Riparian Reserves (RR)** - A Federal (BLM or USFS) land-use allocation which overlays all other land allocations. They are lands along streams and unstable and potentially unstable areas where special standards and guidelines direct land use.

**Riparian Zones** - Those parts of the riparian reserves where actual riparian conditions exist.

**Salem District Record of Decision and Resource Management Plan (May 1995) (RMP)** - The Management Plan that addresses resource management on all Bureau of Land Management administered land within the Salem District.

**Scoping** - An ongoing process to determine the breadth and depth of an environmental analysis.

**Short Term** - The period of time during which the Resource Management Plan will be implemented; assumed to be ten years.

**Snags** - Any standing dead, partially dead, or defective (cull) tree at least 10 inches in diameter at breast height and at least 6 feet tall. A hard snag is composed primarily of sound wood, generally merchantable. A soft snag is composed primarily of wood in advanced stages of decay and deterioration, generally not merchantable.

**Soil compaction** - The increase in soil density (reduction of total porosity) that results from the rearrangement of soil particles in response to applied external forces such as traffic by heavy machinery.

**Soil displacement** - The mechanical movement of the upper organic and mineral surface by equipment and movement of logs. It involves excavation, scalping, exposure of mineral soil and burial.

**Special Habitat** - Habitats of special importance due to their high ecological values. Examples include meadows, rock talus, cliffs and caves.

**Special Status Species** - Plant or animal species falling in any of the following categories:

- . Threatened or Endangered Species
- . Proposed Threatened or Endangered Species
- . Candidate Species
- . State-Listed Species
- . Bureau Sensitive Species
- . Bureau Assessment Species

**Sub-Watershed (SWB)** - A sub-division of the watershed into sub-basins in order to allow tracking of various watershed functions on a more localized (site-specific) basis. For the Quartzville Creek watershed analysis, there are seven sub-watersheds (6<sup>th</sup> field watersheds), which are: Canal Creek, Lone Star, Moose Creek, Packers Gulch, South Green Peter, Upper Quartzville, and Whitcomb Creek.

**Succession** - A series of dynamic changes by which one group of organisms succeeds another through stages leading to potential natural community or climax. An example is the development of series of plant communities (called seral stages) following a major disturbance

**Survey and Manage (S&M)** - A group of species that were defined in the Northwest Forest Plan that have special protection measures associated with them.

**Unmapped LSR** – A Late-Successional Reserve (LSR) associated with a known spotted owl site that was known during the time period that the Northwest Forest Plan was developed (as of January, 1994). These LSRs are mapped on planning maps, but are generally left unmapped on maps available for public use.

**Visual Resources** - The visible physical features of a landscape.

**Visual Resource Management** - The inventory and planning actions taken to identify visual values, establish visual management objectives, and the management actions needed to achieve those objectives.

**Visual Resource Management Classes** - Categories assigned to public lands based on scenic quality, sensitivity level, and distance zones. There are four classes. Each class has an objective that prescribes the amount of modification allowed in the landscape.

**Wetlands or Wetland Habitat** - Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for living in saturated soil conditions. Wetlands generally include, but are not limited to, swamps, marshes, bogs, and similar areas.

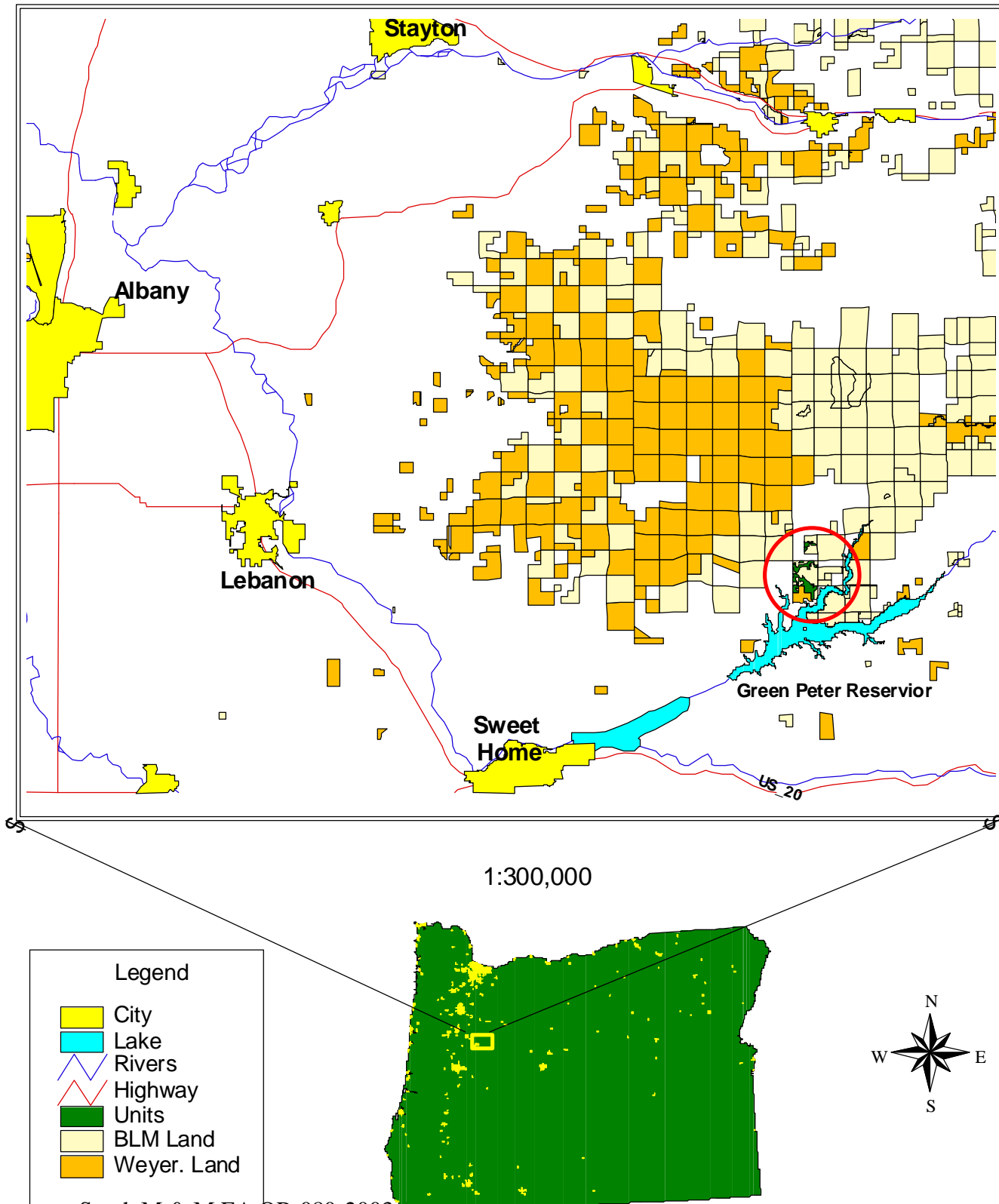


## 6.0 Chapter 6 – Maps and Map Tables

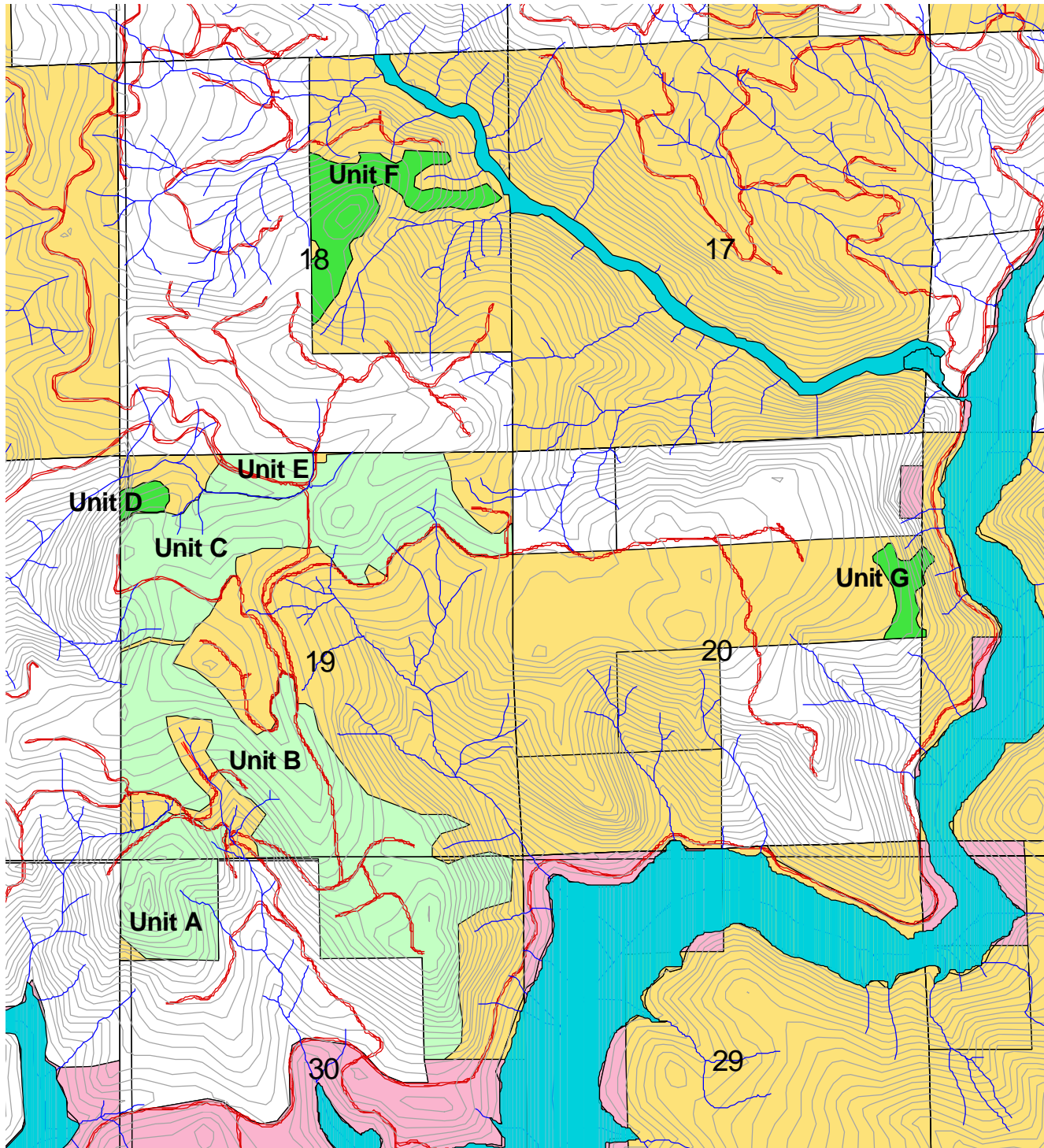
### 6.1 Vicinity Map

#### South M & M

#### Vicinity Map



## 6.2 Contour Map (includes units dropped)



### South M & M Contour Map

T. 12S., R. 3E.

1:20,000  
Contour interval 40 feet



No warranty is made by the  
Bureau of Land Management  
as to the accuracy or  
completeness of this data for  
purposes not intended by BLM.

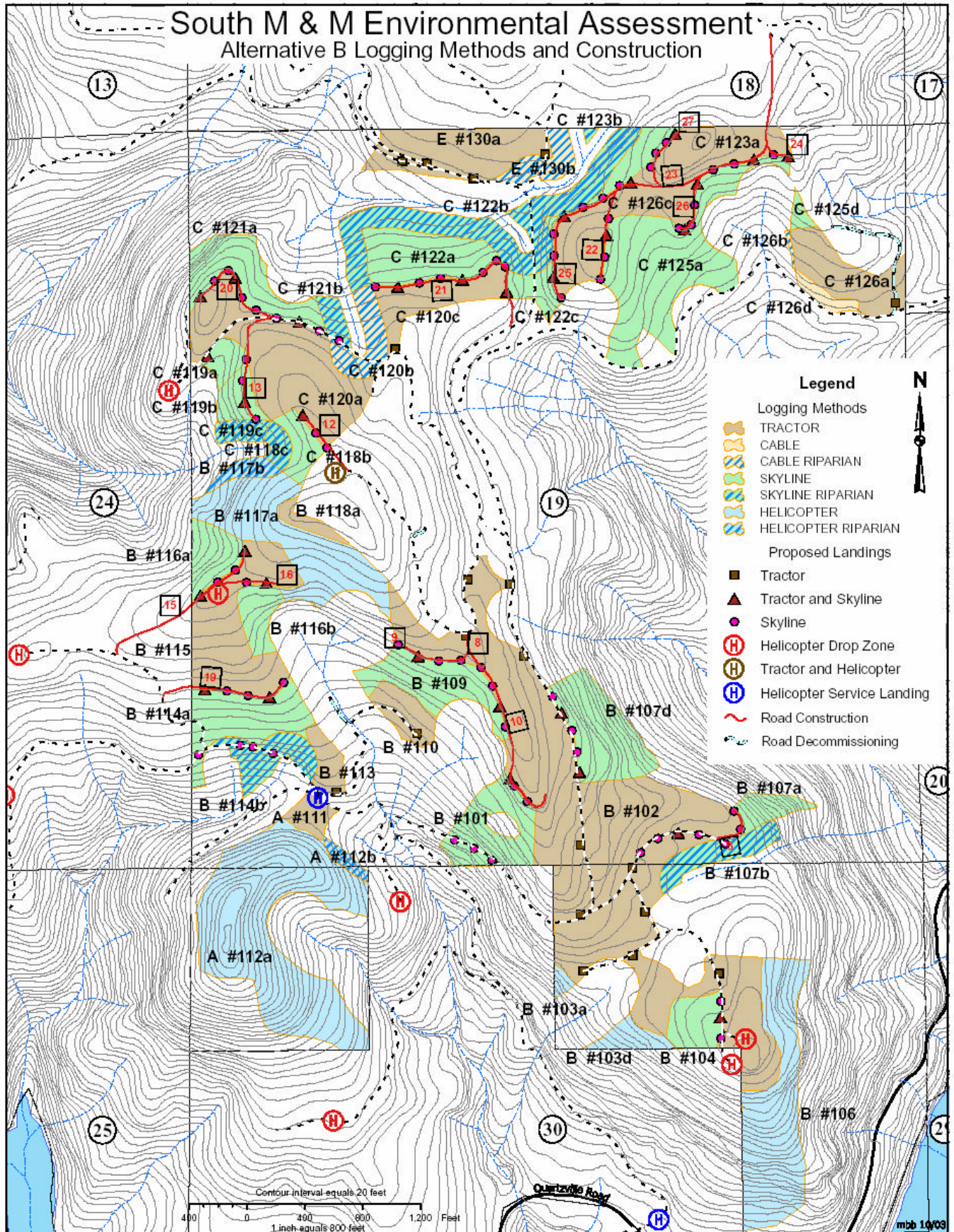


Legend	
<span style="display:inline-block; width:15px; height:15px; background-color:lightgreen; border:1px solid black;"></span>	Surveyed Unit
<span style="display:inline-block; width:15px; height:15px; background-color:green; border:1px solid black;"></span>	Dropped Unit
<span style="display:inline-block; width:15px; height:15px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, blue 2px, blue 4px); border:1px solid black;"></span>	Stream
<span style="display:inline-block; width:15px; height:15px; background-color:lightblue; border:1px solid black;"></span>	Reservoir
<span style="display:inline-block; width:15px; height:15px; background: repeating-linear-gradient(-45deg, transparent, transparent 2px, red 2px, red 4px); border:1px solid black;"></span>	Road
<span style="display:inline-block; width:15px; height:15px; background-color:yellow; border:1px solid black;"></span>	BLM
<span style="display:inline-block; width:15px; height:15px; background-color:pink; border:1px solid black;"></span>	Army Corps of Engineers
<span style="display:inline-block; width:15px; height:15px; background-color:white; border:1px solid black;"></span>	Private

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wrw 10/6/03



### 6.3 Alternative B Map





**Table 6-1: Alternative B sorted by EA unit number**

EA Unit	Log Plan Unit Number	GIS Acres	Alt B Logging Method	Management Area	Harvest Volume MBF
A	112a	23.1	HELICOPTER	Matrix	390
A	112b	0.7	HELICOPTER RIPARIAN	Riparian	11
A	111	1.5	TRACTOR	Matrix	36
<b>Subtotal</b>	<b>EA Unit A =</b>	<b>25</b>	<b>Acres</b>	<b>EA Unit A =</b>	<b>437 MBF</b>
B	103a	0.4	HELICOPTER	Matrix	6
B	103d	1.7	HELICOPTER	Matrix	22
B	106	13.2	HELICOPTER	Matrix	216
B	117a	11.6	HELICOPTER	Matrix	140
B	117b	1.2	HELICOPTER RIPARIAN	Riparian	16
B	101	6.0	SKYLINE	Matrix	79
B	104	2.9	SKYLINE	Matrix	39
B	107a	1.9	SKYLINE	Matrix	25
B	107d	7.3	SKYLINE	Matrix	87
B	109	6.0	SKYLINE	Matrix	96
B	114a	6.6	SKYLINE	Matrix	103
B	116a	3.0	SKYLINE	Matrix	38
B	116b	2.4	SKYLINE	Matrix	41
B	107b	3.2	SKYLINE RIPARIAN	Riparian	42
B	114b	3.5	SKYLINE RIPARIAN	Riparian	55
B	102	52.4	TRACTOR	Matrix	759
B	110	2.6	TRACTOR	Matrix	60
B	113	1.9	TRACTOR	Matrix	29
B	115	10.6	TRACTOR	Matrix	168
B	118a	1.0	TRACTOR	Matrix	12
<b>Subtotal</b>	<b>EA Unit B =</b>	<b>139</b>	<b>Acres</b>	<b>EA Unit B =</b>	<b>2035 MBF</b>
C	126d	1.1	CABLE	Matrix	13
C	120b	3.1	CABLE RIPARIAN	Riparian	42
C	126b	0.2	CABLE RIPARIAN	Riparian	2
C	118b	2.0	SKYLINE	Matrix	33
C	119a	1.5	SKYLINE	Matrix	20
C	119b	1.9	SKYLINE	Matrix	33
C	121a	6.0	SKYLINE	Matrix	101
C	122a	6.4	SKYLINE	Matrix	81
C	122c	1.7	SKYLINE	Matrix	22
C	123a	2.2	SKYLINE	Matrix	27
C	123d	0.1	SKYLINE	Matrix	2
C	125a	15.3	SKYLINE	Matrix	192
C	125d	0.6	SKYLINE	Matrix	7
C	118c	1.0	SKYLINE RIPARIAN	Riparian	17
C	119c	1.2	SKYLINE RIPARIAN	Riparian	21
C	121b	1.1	SKYLINE RIPARIAN	Riparian	15
C	122b	11.2	SKYLINE RIPARIAN	Riparian	141
C	123b	0.2	SKYLINE RIPARIAN	Riparian	2
C	120a	14.9	TRACTOR	Matrix	250
C	120c	4.9	TRACTOR	Matrix	61
C	126a	5.7	TRACTOR	Matrix	71
C	126c	14.2	TRACTOR	Matrix	178
<b>Subtotal</b>	<b>EA Unit C =</b>	<b>96</b>	<b>Acres</b>	<b>EA Unit C =</b>	<b>1332 MBF</b>
E	130b	2.4	CABLE RIPARIAN	Riparian	30
E	130a	8.2	TRACTOR	Matrix	104
<b>EA Unit E =</b>	<b>11</b>	<b>Acres</b>	<b>EA Unit E =</b>	<b>134</b>	<b>MBF</b>
<b>Total</b>	<b>South M &amp; M =</b>	<b>272</b>	<b>Acres</b>	<b>South M &amp; M =</b>	<b>3938 MBF</b>

mbb 8/6/03

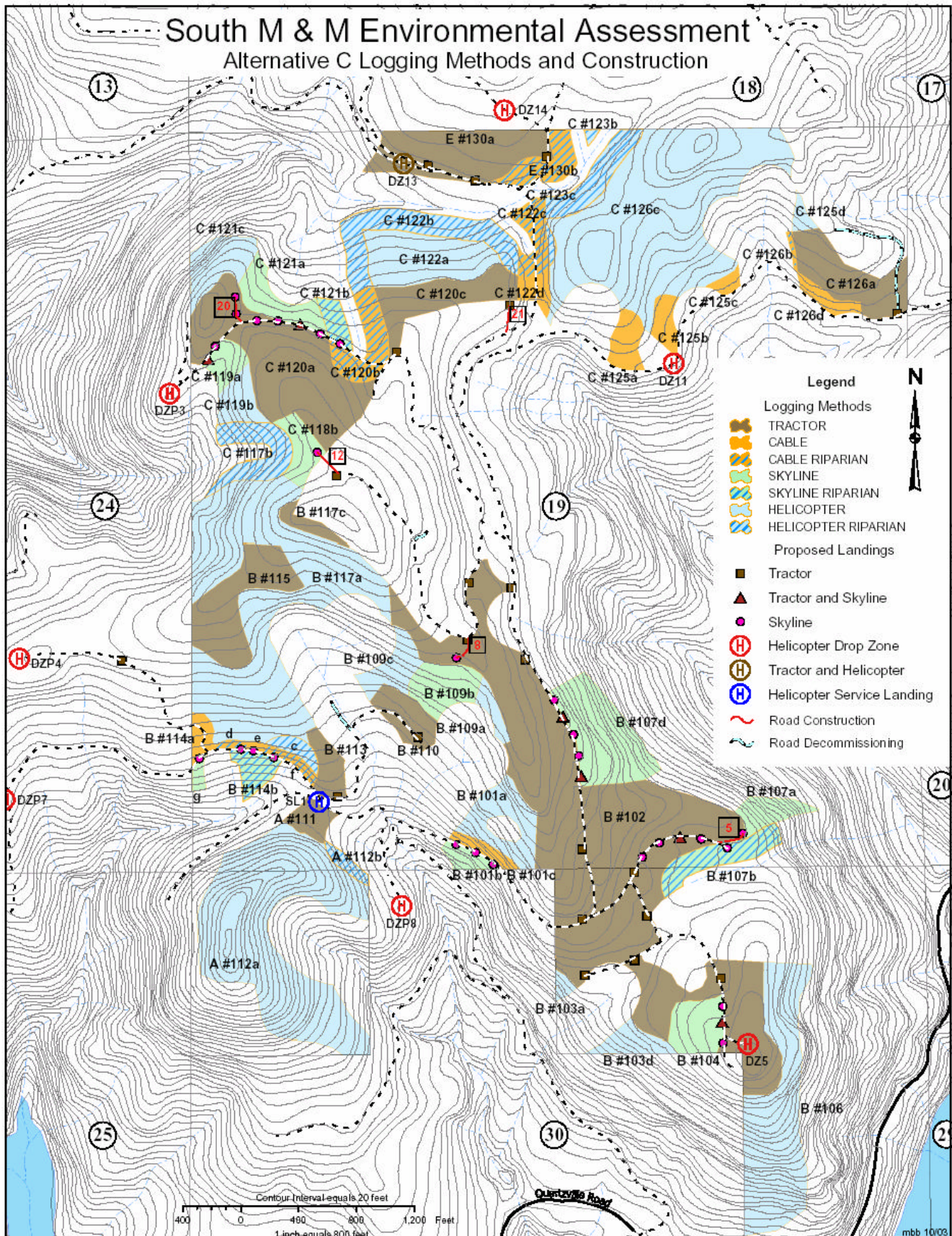
**Table 6-2: Alternative B sorted by construction lengths**

<b>Alternative B Road Construction</b>			
Construction Segment Number Refer to Map for Location	Construction Segment Length Feet	Construction Segment Length Miles	
5	353	0.1	
8	125	0.0	
9	502	0.1	
10	1354	0.3	
12	489	0.1	
13	822	0.2	
15	1221	0.2	
16	433	0.1	
19	904	0.2	
20	779	0.1	
21	1410	0.3	
22	621	0.1	
23	1917	0.4	
24	186	0.0	
25	1000	0.2	
26	435	0.1	
27	477	0.1	
Total =	17520 Feet	3.3 Miles	

mbb 8/21/03



## 6.4 Alternative C Map





**Table 6-3: Alternative C sorted by EA unit number**

EA Unit	Log Plan Unit Number	GIS Acres	Alt C Logging Method	Management Area	Total Unit Volume MBF
A	112a	23.1	HELICOPTER	Matrix	390
A	112b	0.7	HELICOPTER RIPARIAN	Riparian	11
A	111	1.5	TRACTOR	Matrix	36
<b>Subtotal</b>	<b>EA Unit A =</b>	<b>25</b>	<b>Acres</b>	<b>EA Unit A =</b>	<b>437 MBF</b>
B	101c	0.9	CABLE	Matrix	12
B	114a	0.9	CABLE	Matrix	15
B	114e	0.1	CABLE	Matrix	2
B	114d	0.3	CABLE RIPARIAN	Matrix	5
B	114f	0.7	CABLE RIPARIAN	Matrix	10
B	101a	4.0	HELICOPTER	Matrix	53
B	103a	0.4	HELICOPTER	Matrix	6
B	103d	1.7	HELICOPTER	Matrix	22
B	106	13.2	HELICOPTER	Matrix	216
B	109a	1.0	HELICOPTER	Matrix	16
B	109c	2.4	HELICOPTER	Matrix	38
B	117a	26.0	HELICOPTER	Matrix	315
B	114c	0.9	HELICOPTER RIPARIAN	Riparian	14
B	101b	1.1	SKYLINE	Matrix	14
B	104	2.9	SKYLINE	Matrix	39
B	107a	1.9	SKYLINE	Matrix	25
B	107d	7.3	SKYLINE	Matrix	87
B	109b	3.1	SKYLINE	Matrix	50
B	114g	0.4	SKYLINE	Matrix	7
B	107b	3.2	SKYLINE RIPARIAN	Riparian	42
B	114b	1.6	SKYLINE RIPARIAN	Riparian	26
B	102	51.9	TRACTOR	Matrix	752
B	110	2.6	TRACTOR	Matrix	60
B	113	1.9	TRACTOR	Matrix	29
B	115	6.7	TRACTOR	Matrix	107
B	117c	1.0	TRACTOR	Matrix	12
<b>Subtotal</b>	<b>EA Unit B =</b>	<b>138</b>	<b>Acres</b>	<b>EA Unit B =</b>	<b>1975 MBF</b>

*(Table continued on following page)*

**Table 6-3: Alternative C sorted by EA unit number (continued)**

EA Unit	Log Plan Unit Number	GIS Acres	Alt C Logging	Management Area	Total Unit Volume MBF	EA Unit	Log Plan
C	122d	1.1		CABLE	Matrix	14	
C	125a	1.8		CABLE	Matrix	22	
C	125b	1.3		CABLE	Matrix	16	
C	125c	0.5		CABLE	Matrix	7	
C	126d	1.1		CABLE	Matrix	13	
C	120b	3.1		CABLE RIPARIAN	Riparian	42	
C	122c	2.0		CABLE RIPARIAN	Riparian	25	
C	126b	0.2		CABLE RIPARIAN	Riparian	2	
C	119b	1.9		HELICOPTER	Matrix	33	
C	121c	3.2		HELICOPTER	Matrix	53	
C	122a	6.4		HELICOPTER	Matrix	81	
C	125d	0.6		HELICOPTER	Matrix	7	
C	126c	28.5		HELICOPTER	Matrix	360	
C	117b	3.5		HELICOPTER RIPARIAN	Riparian	58	
C	122b	5.9		HELICOPTER RIPARIAN	Riparian	74	
C	123b	0.2		HELICOPTER RIPARIAN	Riparian	2	
C	123c	3.3		HELICOPTER RIPARIAN	Riparian	41	
C	118b	2.0		SKYLINE	Matrix	33	
C	119a	1.5		SKYLINE	Matrix	20	
C	121a	2.8		SKYLINE	Matrix	48	
C	121b	1.1		SKYLINE RIPARIAN	Riparian	15	
C	120a	14.9		TRACTOR	Matrix	250	
C	120c	5.1		TRACTOR	Matrix	65	
C	126a	5.7		TRACTOR	Matrix	71	
<b>Subtotal</b>	<b>EA Unit C =</b>	<b>98</b>	<b>Acres</b>		<b>EA Unit C =</b>	<b>1353</b>	<b>MBF</b>
E	130b	2.4		CABLE RIPARIAN	Riparian	30	
E	130a	8.2		TRACTOR	Matrix	104	
<b>Subtotal</b>	<b>EA Unit E =</b>	<b>11</b>	<b>Acres</b>		<b>EA Unit E =</b>	<b>134</b>	<b>MBF</b>
<b>Total</b>	<b>South M &amp; M</b>	<b>272</b>	<b>Acres</b>		<b>South M &amp; M =</b>	<b>3899</b>	<b>MBF</b>

mbb 8/21/03

**Table 6-4: Alternative C sorted by construction lengths**

Alternative C Road Construction			
Construction Segment Number Refer to Map for Location	Alt C Construction Segment Length Feet	Alt C Construction Segment Length Miles	
5	194	0.04	
8	205	0.04	
12	200	0.04	
20	195	0.04	
21	203	0.04	
Total =	997 Feet	0.2 Mile	

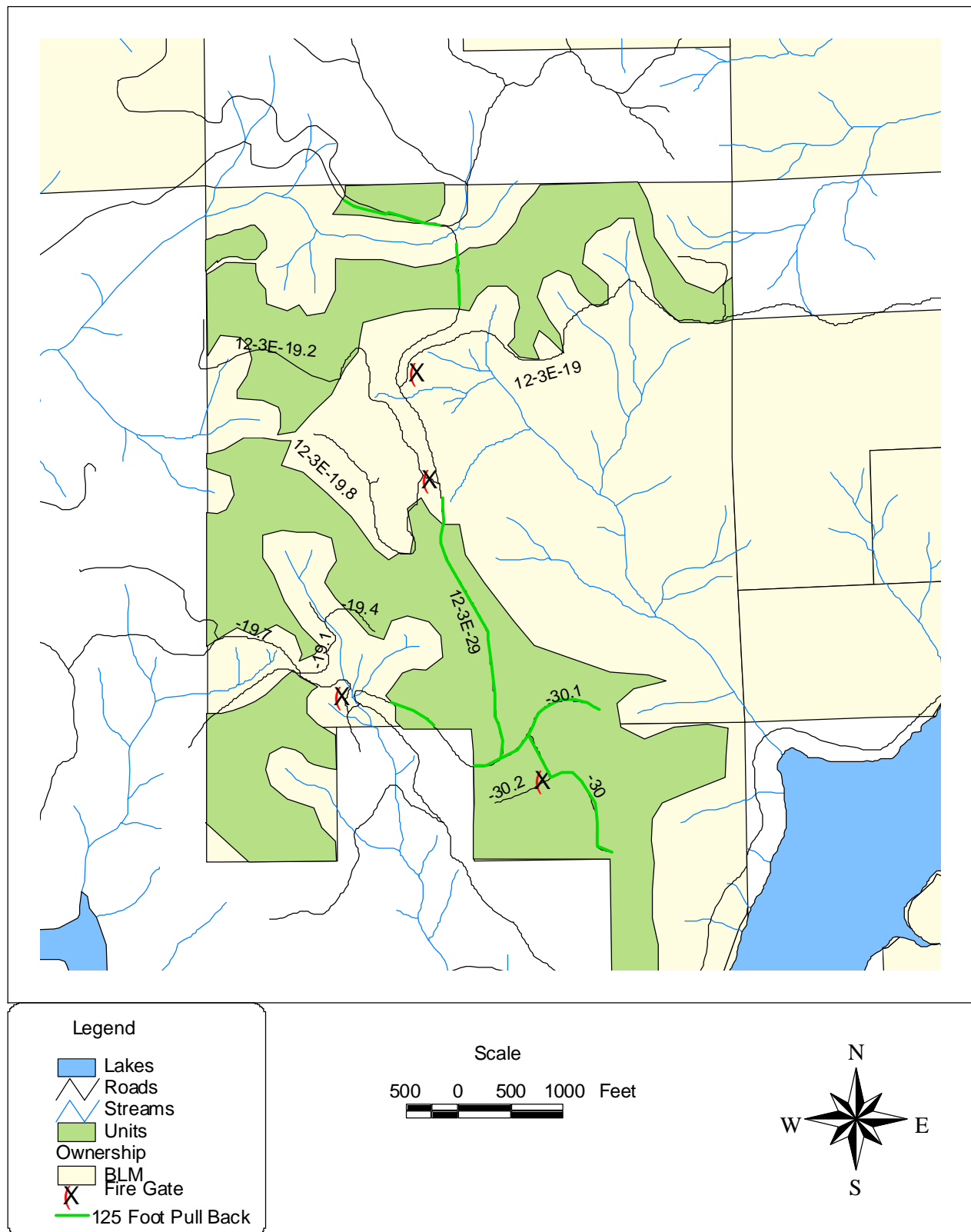
mbb 8/21/03



## 6.5 Fire/Fuels Road Plan Map

# South M & M

## Fire/Fuels Road Plan



N:\cascades\stimbals\es\2004\southmm\planning\maps\photos\fire fuels gate plan

RHerrin, 15 August, 2008

## **7.0 Appendices**

### **7.1 Appendix A – Scoping and Issue Identification**

#### **7.1.1 Scoping**

##### ***Public Scoping***

In compliance with NEPA, the project has appeared in the *Salem District Project Update* since September 2000 and in editions since then, which were mailed to over 1,000 addresses. Also, a scoping letter was mailed on April 25, 2003 to 38 potentially affected and/or interested individuals, groups, and agencies. Thirteen letters and four phone calls were received as a result of this scoping as of July 1, 2003. These letters are available for inspection in the project development file at the Salem District office. The following concerns were raised by members of the public as a result of scoping:

##### **1. Harvesting Old Growth Forests and Trees**

The bulk of the letters received expressed concerns about harvesting old growth habitat and adverse impacts of harvesting old growth on recreation, water quality and wildlife. Specifically, concerns were expressed about harvesting units D, F and G, which are older forests 70 to 130 years of age with scattered old growth remnants.

**Response:** The Interdisciplinary Team is not recommending any harvest of old growth or old growth habitat. Units D, F and G have been dropped from the proposal. The proposal consists of thinning of stands that do not meet the criteria for old growth. This concern is not a potential issue because no harvest of old growth or old growth habitat is planned as part of this proposal.

##### **2. Clearcutting and Cumulative Effects**

Many of the letters expressed concerns about clearcutting forests and cumulative effects from past logging in the vicinity.

**Response:** No clearcut or regeneration harvest is planned as part of this proposal. The proposal consists of thinning only, and any cumulative effects associated with the proposal are described in Chapter 3 of the EA.

##### **3. The Purpose of Matrix lands**

One letter asked that we accurately describe the purpose of Matrix lands and that due to the South M&M area's location close to Late Successional Reserves (LSR), the purpose of Matrix lands needs to be considered in context with the rest of the landscape.

**Response:** The purpose of Matrix lands is described in the RMP, pages 20-22 and 46-48. The project area is located in Critical Habitat in the Matrix between two LSRs. Since these stands are located in Critical Habitat in the Matrix, the emphasis of this proposal would be thinning to improve stand diversity and structure, maintain canopy closure, and provide for other resource values, as well as provide some forest products and contribute to local economic diversity. This concern will be incorporated into concern #8, Spotted Owls and Critical Habitat, which constitutes an issue that is addressed in Chapter 3 of this EA.

#### 4. New Road Construction

The construction of new roads was raised as a concern.

**Response:** The Proposed Action does involve the construction of new roads to facilitate logging. This concern has led to the development of an additional alternative, Alternative C, which includes more helicopter logging than conventional logging requiring road construction. Where roads are no longer needed for management or may not be needed for a long period of time, closing or decommissioning will be considered. Roads and road construction are considered to be an issue that is addressed in Chapter 3 of this EA.

#### 5. Thinning

There were a number of positive comments about thinning, including a preference shown toward thinning rather than regeneration harvest, and thinning younger stands. Two writers said they had little objection to thinning units A, B, C, and E. A concern was raised regarding thinning. The writer stated that it would be a poor decision to thin these stands, and went on to say that protecting communities and camping areas from forest fires is important, so thinning a small concentrated area makes sense, but thinning acres and acres of land doesn't.

**Response:** This proposal includes plans to thin approximately 272 acres of BLM land. The purpose of thinning is not for the protection of communities and camping areas. The main purpose of thinning is to improve stand diversity and structure, maintain canopy closure, and provide for other resource values through thinning and density management, and provide some forest products and contribute to local economic diversity.

#### 6. Red Tree Voles

There were a number of concerns regarding the presence of red tree voles in the project area.

**Response:** Surveys to protocol were conducted according to *Survey Protocol for the Red Tree Vole*, dated February 18, 2000. Active red tree vole nests were located in four locations in unit B, and two locations in unit F. Unit F has since been dropped from the proposal. The remaining four locations in unit B will be protected according to *Management Recommendations for the Oregon Red Tree Vole*, dated September 27, 2000, which require a minimum of a 10 acre contiguous Habitat Area, maintaining at least one site potential tree height between nest trees and the Habitat Area boundary. The presence of red tree voles in the area has resulted in changes to the proposal, and constitutes an issue that is addressed in Chapter 3 of this EA.

## **7. Cultural sites**

A representative from the Confederated Tribes of the Grand Ronde contacted us regarding a potential site in section 30, and expressed a concern with ground disturbance activities that would disturb more than the top 12 inches of ground surface.

**Response:** Surveys for cultural and archeological resources were conducted and no sites were identified in the proposed units. If any sites are identified during timber harvesting, the operations would be immediately halted, and operations would be resumed only after appropriate mitigation measures were designed and implemented to provide protection of those resources. This concern is not a potential issue because mitigation measures are considered to be adequate to protect any sites identified during timber harvesting activities that weren't detected during surveys.

### ***IDT Field Review and Initial Office Meeting***

The IDT conducted a field review of the project area on May 20, and had IDT office meetings on May 28, June 16, and August 11, 2003. The following concerns were raised by members of the IDT during the field review and office meetings:

## **8. Spotted Owls and Critical Habitat**

This project “may affect, and is likely to adversely affect” the spotted owl due to the modification of dispersal and marginal suitable habitat. The project area is located in Critical Habitat in the Matrix, which is to be managed according to the Management Actions and Direction for the Matrix LUA (RMP pp.20-22). However, since these stands are located in Critical Habitat in the Matrix, the emphasis of this proposal would be thinning to improve stand diversity and structure, maintain canopy closure, and provide for other resource values, as well as provide some forest products and contribute to local economic diversity. Critical Habitat has resulted in changes to the proposal, and constitutes an issue that is addressed in Chapter 3 of this EA.

## **9. Bald Eagles**

The Green Peter Peninsula bald eagle nest site is located approximately ½ to ¾ miles south of the southern tip of unit B. Even though the nest tree is considered to be outside of disturbance range (> ½ mile), it is visible from the proposed helicopter landing in the southern portion of unit B. The bald eagle is not considered to be an issue because the entire project area is over ½ mile from the known bald eagle nest tree and with a seasonal restriction on helicopter operations in the southern portion of unit B, no impacts to bald eagles are anticipated.

## **10. Visual Resources**

Concerns were expressed regarding the effects of the proposal to Visual Resources. Portions of units B and G are in Visual Resource Management (VRM) II, and unit A is in VRM III. There are critical viewpoints on Quartzville Road and Green Peter Reservoir. These concerns are not considered to be a potential issue because unit G has been dropped and the level of thinning proposed in units A and B would comply with VRM guidelines.

## **11. Recreational Use**

Concern was expressed regarding recreational use and disturbance during the peak recreation season due to logging and hauling. Recreational use of the proposed units would be restricted in the short term during the thinning operation. If the units proposed for helicopter logging are harvested during the peak use season, some dispersed campsites along Quartzville Road may need to be temporarily closed for safety. Campers at sites in the vicinity of the units that are not closed may still experience some noise disturbance. These concerns are considered to be a potential issue because effects lead to major discussions in the IDT meetings and resulted in some changes to the proposed action.

## **12. Survey and Manage Species**

Two Survey and Manage fungi and one mollusk species were found during protocol surveys of the project area. This concern is not a potential issue because with the application of buffers and reserve areas, and the maintenance of canopy closure through thinning, favorable habitat conditions will be maintained for continued presence of these species in the area.

## **13. Soils**

Concerns were expressed regarding soils and soil stability in units A, D, F, and G. This concern is not a potential issue because units D, F and G have been dropped from the proposal and unit A is planned for helicopter logging under both alternates, which would provide adequate protection of the soils and soil stability.

## **14. Forest Health - Laminated Root Rot Infections**

Laminated root rot infections were found at two locations in unit A and several locations in unit B. Canopy closure is reduced because of Douglas-fir mortality and perimeter trees show signs of infection such as fading and thinning crowns. These openings are not functioning the same as the surrounding forest habitat because of the reduced canopy (less than 20% in some cases), and they are located within visually sensitive areas where maintenance of a canopy is important. These laminated root rot areas are considered to be an issue because they do affect the proposal and alternative methods are required to treat or mitigate the effect of the disease.

### **7.1.2 Issues Identification Summary**

The purpose of this summary is to identify the issues to be addressed in detail in the EA. These issues are defined as major points of discussion relating to the effects of the project on a resource. Resource effects can be issues when the effects of the project:

- Lead to the development of action alternatives, and/or
- Are likely to adversely affect a T/E species (May affect, likely to adversely affect), and/or
- Result in adjusting the proposed action, or is a major point of discussion in the IDT meetings. There are some resource effects that are discussed at length in IDTs, and options are explored and the proposed action may change as a result of these discussions, and/or
- Could have a major beneficial effect on the resource. There is a major adverse effect of the no action alternative.

The following questions were used to determine which resource effects are issues to be addressed in detail in this EA.

1. Which Elements of the Human Environment (Critical and other Elements) are affected by this project?

Air Quality, Cultural Resources, Threatened or Endangered Wildlife Species or Habitat, Hazardous or Solid Wastes, Water Quality, Wetlands/Riparian Zones, Invasive Nonnative Species, Fire Hazard/Risk, Recreation, Soils and Site Productivity, Special Areas outside ACECs, Special Status and SEIS Special Attention Plant Species/Habitat, Special Status and SEIS Special Attention Wildlife Species/Habitat, Visual Resources, Water Resources, and Forest Health.

2. Does the proposed action adversely affect ESA Threatened or Endangered Species (May affect, likely to adversely affect)?

### **Spotted Owls and Critical Habitat**

3. For each affected element (resource) from question 1:

- a. Does the effect on this resource drive the development of action alternatives?

### **New Road Construction**

- b. Are there major beneficial effects on this resource (e.g. structure diversity in LSR or that most of the riparian reserves in the project area can benefit)? Or are there major adverse effects associated with the No action alternative?

Although the proposal will benefit and improve stand diversity and structure in Riparian Reserves (29 acres), it is not considered to be major as most of the Riparian Reserves in the area are not planned for treatment.

- c. Did resource effects lead to major discussions in the IDT meeting and/or result in changes to the proposed action?

### **Red Tree Voles**

### **Recreational Use**

### **Forest Health - Laminated Root Rot Infections**

The following issues will be addressed in detail in this EA:

### **The Effects of the Proposal on Spotted Owls and Critical Habitat**

### **The Effects of New Road Construction**

### **The Effects of the Proposal on Red Tree Voles**

### **The Effects of the Proposal on Recreational Use**

### **The Effects of Laminated Root Rot Infections in the project area**

## 7.2 Appendix B - Aquatic Conservation Strategy Objectives

**Table 7-1: Documentation of the South M & M Projects' Consistency with the Four Components of the Aquatic Conservation Strategy**

ACS Component	Project Consistency
Component 1 - Riparian Reserves	The Riparian Reserve boundaries would be established consistent with direction from the Salem District Resource Management Plan (p. 10). Additionally, maintaining canopy cover along all streams and the wetlands would protect stream bank stability and water temperature. Additionally, there would be no new road construction within the Riparian Reserve.
Component 2 - Key Watershed	The projects are located within the Quartzville Creek watershed, which is not a designated key watershed.
Component 3 - Watershed Analysis	The Quartzville Creek Watershed Analysis document was completed in September 2002. All projects are consistent with the recommendations in the Watershed Analyses.
Component 4 - Watershed Restoration	Increasing stand diversity in Riparian Reserves addresses this component.

**Table 7-2: Documentation of the South M & M Projects' Consistency with the Nine Aquatic Conservation Strategy Objectives**

**ACS Objective 1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.** *None of the alternatives or projects retard or prevent the attainment of ACS Objective 1.*

Alternative A: No Action

The No Action alternative would maintain the development of the existing vegetation and associated stand structure at its present rate.

Alternative B: Proposed Action

- Project 1 (Timber Harvest and Associated Silvicultural Treatments): Past management has altered much of the landscape, including Riparian Reserves so that stand diversity and structure is limited in this portion of the watershed. Over time, the proposed treatments are expected to result in forest stands that exhibit attributes typically associated with stands of a more advanced age and stand structural development (larger trees, a more developed understory, and an increase in the number, size and quality of snags and down logs). By creating up to 4 snags per acre in portions of the Riparian Reserves we are afforded the opportunity to restore to a small part of the watershed some of the structural attributes that are lacking due to past management. The net effect of this would be a more diverse and structurally complex landscape that would help to protect and enhance adjacent aquatic ecosystems.
- Project 2 (Road Decommissioning in Riparian Reserve): Decommissioning 1,200 feet of road would restore approximately one acre in Riparian Reserve to forested habitat in the long term.

Alternative C: Limited Road Construction

- Project 1 (Timber Harvest and Associated Silvicultural Treatments): Fragmentation of habitat due to new road construction would be less than under Alternative B. Alternative C is expected to result in fewer direct impacts to CWD and residual green trees, the resulting slash is expected to be more contiguous, and the understory less disturbed than would occur under Alternative B.



**ACS Objective 2. Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. The network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian dependent species.**

*None of the alternatives or projects retard or prevent the attainment of ACS Objective 2.*

Alternative A: No Action

The No Action alternative would have little effect on landscape level connectivity. The current condition of connectivity would be maintained.

Alternative B: Proposed Action

- Project 1 (Timber Harvest and Associated Silvicultural Treatments): The proposed action would have little direct effect on connectivity between watersheds due to the discontinuous ownership patterns that exist. However, by restoring stand structural elements that provide habitat and refugia, it is anticipated that it would help to strengthen local connectivity within the watershed, both inside and outside of Riparian Reserves.
- Project 2 (Road Decommissioning in Riparian Reserve): Decommissioning 1,200 feet of road would restore approximately one acre in Riparian Reserve to forested habitat, and thus improve connectivity slightly in the long term.

Alternative C: Limited Road Construction

- Project 1 (Timber Harvest and Associated Silvicultural Treatments): The effects of Alternative C are expected to be similar to Alternative B. Connectivity would be slightly less disrupted due to less road construction involved in Alternative C.

**ACS Objective 3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.** *None of the alternatives or projects retard or prevent the attainment of ACS Objective 3.*

Alternative 1: No Action

The current condition of the physical integrity of the aquatic system would be maintained.

Action Alternatives

- Project 1 (Timber Harvest and Associated Silvicultural Treatments): This proposal is unlikely to alter the current condition of channels in the project area. Minimization of direct disturbances from the proposed action (e.g. increased flows or sediment delivery) is likely to result in the maintenance of stream channels in their current condition. No new road construction or new stream crossings are planned in Riparian Reserves.
- Project 2 (Road Decommissioning in Riparian Reserve): Decommissioning 1,200 feet of road in Riparian Reserve would not affect the physical integrity of the aquatic system. No stream crossings are involved.

**ACS Objective 4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities. *None of the alternatives or projects retard or prevent the attainment of ACS Objective 4.***

Alternative A: No Action

The current condition of water quality would be maintained.

Alternative B: Proposed Action

- Project 1 (Timber Harvest and Associated Silvicultural Treatments): No entry buffers in Riparian Reserves would be maintained (minimum of 50 feet in treatment areas and up to 220 feet in untreated areas). All of the proposed roads are on ridgetop or midslope locations with no hydrologic connections or proximity to streams or riparian areas. No stream crossings or road construction would take place in the Riparian Reserves. BMPs and other design features are proposed to eliminate and/or limit acceleration of sediment delivery to streams in the project area. As a result, it is unlikely that this proposal would lead to a measurable change in water quality, including increases in sediment delivery to streams, stream turbidity, stream temperatures or dissolved oxygen levels, or the alteration of stream substrate composition, or sediment transport regime in project area streams.
- Project 2 (Road Decommissioning in Riparian Reserve): This action is unlikely to have any effect on water quality or watershed hydrology. Beneficial effects, such as the potential reduction of road related sediment yield may be realized since the road segments that are planned for decommissioning are within Riparian Reserves.

Alternative C: Limited Road Construction

- Project 1 (Timber Harvest and Associated Silvicultural Treatments): Alternative C as proposed would greatly reduce any risk to water quality associated with Project 1.

**ACS Objective 5. Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.** *None of the alternatives or projects retard or prevent the attainment of ACS Objective 5.*

Alternative A: No Action

The current condition of the sediment regime would be maintained.

Alternative B: Proposed Action

- Project 1 (Timber Harvest and Associated Silvicultural Treatments): No entry buffers in Riparian Reserves would be maintained (minimum of 50 feet in treatment areas and up to 220 feet in untreated areas). All of the proposed roads are on ridgetop or midslope locations with no hydrologic connections or proximity to streams or riparian areas. No stream crossings or road construction would take place in the Riparian Reserves. BMPs and other design features are proposed to eliminate and/or limit acceleration of sediment delivery to streams in the project area. As a result, it is unlikely that this proposal would lead to a measurable change in sediment regime, including increases in sediment delivery to streams, stream turbidity, or the alteration of stream substrate composition or sediment transport regime.
- Project 2 (Road Decommissioning in Riparian Reserve): This action is unlikely to have any effect on water quality or watershed hydrology. Beneficial effects, such as the potential reduction of road related sediment yield may be realized since the road segments that are planned for decommissioning are within Riparian Reserves.

Alternative C: Limited Road Construction

- Project 1 (Timber Harvest and Associated Silvicultural Treatments): Alternative C as proposed would greatly reduce any risk to sediment regime associated with Project 1.

**ACS Objective 6. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.**

*None of the alternatives or projects retard or prevent the attainment of ACS Objective 6.*

Alternative A: No Action

The current condition of in-stream flows would be maintained.

Alternative B: Proposed Action

- Project 1 (Timber Harvest and Associated Silvicultural Treatments): All of the proposed roads and landings are on ridgetop or midslope locations in flat areas with no hydrologic connections or proximity to streams or riparian areas. BMPs and other design features are proposed to minimize changes to in-stream flows. Roads constructed on flat surfaces disturb less of the sub-surfaces and thus have little or no effect on sub-surface or groundwater flow. Since alternatives B and C will maintain all treated stands at no less than 40% crown closure, this proposal has a low risk for contributing to cumulative increases in peak flows.
- Project 2 (Road Decommissioning in Riparian Reserve): This action would have no adverse effect on timing, magnitude, duration, and spatial distribution of peak, high, and low flows. Over the long term, recovery of vegetation on the road surface would, if left undisturbed, eventually lead to a return of pre-disturbance conditions.

Alternative C: Limited Road Construction

- Project 1 (Timber Harvest and Associated Silvicultural Treatments): Alternative C as proposed would greatly reduce any risk to in-stream flows associated with Project 1.

**ACS Objective 7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands. *None of the alternatives or projects retard or prevent the attainment of ACS Objective 7.***

Alternative A: No Action

The current condition of floodplain inundation and water tables would be maintained.

Action Alternatives

- Project 1 (Timber Harvest and Associated Silvicultural Treatments): There would be no alteration of any stream channel, wetland or pond morphological feature. All operations, equipment and disturbances are kept a minimum of 50 feet from all wetlands and stream channels. Thus, the current condition of floodplain inundation and water tables would be maintained.
- Project 2 (Road Decommissioning in Riparian Reserve): This action would have no adverse effect on floodplain inundation and water tables.

**ACS Objective 8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.** *None of the alternatives or projects retard or prevent the attainment of ACS Objective 8.*

Alternative A: No Action

The current condition of plant communities within riparian areas would be maintained. No action would preclude an opportunity to restore species composition and structural diversity of plant communities in treatment areas.

Action Alternatives

- Project 1 (Timber Harvest and Associated Silvicultural Treatments): The proposed action would have no adverse effects on species composition and structural diversity of plant communities in riparian areas and wetlands due no treatment buffers varying from a minimum of 50 feet in treatment areas, to the full Riparian Reserve in no treatment areas. The Riparian Reserve treatments would help to restore species composition and structural diversity currently lacking treatment areas.
- Project 2 (Road Decommissioning in Riparian Reserve): Species composition and structural diversity of plant communities on approximately one acre in Riparian Reserve would be restored to forested habitat in the long term.

**ACS Objective 9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.** *None of the alternatives or projects retard or prevent the attainment of ACS Objective 9.*

Alternative A: No Action

The No Action alternative would result in the continued development at the current rate with no known effect on the dependent species

Action Alternatives

- Project 1 (Timber Harvest and Associated Silvicultural Treatments): The proposed action would have no adverse effect on riparian dependent species. Although thinning activities may affect invertebrates within the treatment areas, adjacent non-thinned areas should provide adequate refugia for the species. In the long term, the treatments would restore elements of structural diversity to treatment areas in Riparian Reserves. These attributes would help to provide resources currently lacking or of low quality, and over the long-term, would benefit both aquatic and terrestrial species.
- Project 2 (Road Decommissioning in Riparian Reserve): Species composition and structural diversity of plant communities on approximately one acre in Riparian Reserve would be restored to forested habitat in the long term.